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**FINAL REPORT**

1965

**Shelter Occupancy Studies  
at the University of Georgia**

**OCD Contract No. OCD-PS-65-45  
OCD Work Unit 1521A**

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### **Abstract**

From 1962 through 1965 the University of Georgia Civil Defense Research Staff conducted eight simulated community fallout shelter occupancy tests for the Office of Civil Defense.

Investigated variables included organizational and environmental factors. Participants were men, women, and children, aged 1-70 years.

The last two 300-person tests, conducted in 1965, form the basis for this report. Details of previous occupancy tests may be found in prior annual reports.

## Chapter 1 - The Research Mission

### I. Introduction

The occupancy studies conducted to date at the University of Georgia have indicated the adequacy of presently stocked OCD supplies for the maintenance of good physiological state of healthy men, women, and children. It has also been found that no deleterious psychological or social effects occur from two-week periods of group confinement under austere conditions.

By the spring of 1963, it was apparent to the Georgia researchers that certain aspects of occupancy research had emerged as pivotal points for future research. These aspects were at that time presented to the Office of Civil Defense as follows: (1) the development of an in-shelter training program that would (a) help occupants to adjust rapidly to shelter life, and (b) prepare them for immediate adjustment to the post-attack world upon emergence; (2) the development of an abbreviated yet realistic shelter manager training course to be implemented on a nationwide basis in event of a sudden nuclear emergency; (3) the development of an in-shelter handbook for use by groups without a trained shelter manager; (4) continual assessment of changes in the OCD stocking policy. It was further recommended that these four areas be evaluated experimentally.



### II. In-Shelter Program

The need for a good in-shelter program is obvious. However, there can be various emphases placed on the orientation of such a program. The Georgia researchers believe that training involving shelter adjustment can be effected within a few days; the program should then be oriented toward adjustment to the post-attack world. This training involves both the empirical knowledge of physical adjustment, e.g., decontamination techniques, sources of stored food supplies, etc., and also psychological

preparation, i.e., strengthening of morale and motivation, so that upon emergence the civilian population will "turn to" and exert maximal effort toward national stabilization.

### III. Shelter Manager Training

The historical record of the U.S. indicates a reluctance in preparing for war. The public attitude toward Civil Defense seems to indicate a slowness in implementing a civilian training program. There is a possibility, therefore, that this nation will suddenly encounter a nuclear emergency without sufficient civilian preparation for fallout shelter living. Consequently, and realistically, it would appear advisable to have ready a practical short course, crash program type of shelter manager training, amenable to instant nationwide implementation. This program might conceivably be reduced to a one-day indoctrination in the essentials of survival.



### IV. Shelter Handbook

The severest assumption, of course, is that the civilian population will be totally unprepared and suddenly thrust into the community fallout shelter situation. This possibility should be met realistically. A solution would be a handbook to be placed in all fallout shelters as part of standard stocking procedures. The handbook would be constructed in such a way that it could be implemented by the naive shelter leader with average intelligence. Followed faithfully, the content of the manual would insure in-shelter training and adjustment, as well as adequate planning for post-shelter emergence.

## Chapter 2 - Previous Research

### I. A Basic Premise

The basic orientation of the research effort at the University of Georgia is to prepare for the ultimate and most realistic nuclear emergency situation, described as one in which the civilian population will enter community fallout shelters without the benefit of a trained shelter manager. A shelter handbook appears to be a solution to this emergency. However, the content of such a manual should be experimentally validated, utilizing large groups confined under minimal survival conditions, and, if possible, in actual community fallout shelters.

Concurrently with the derivation of the shelter handbook, experimental studies should be conducted on in-shelter training programs and post-attack preparation. Evaluation of OCD shelter provisions would parallel these investigations. Even though research would be centered on the situation in which there would be no trained shelter manager, development of shelter manager staff training should not be neglected. Therefore, occupancy tests should also evaluate the effectiveness of shelter manager training, and the development of a maximally effective training program in minimal time.

### II. Past Studies

From 1962 to the present date, the University of Georgia Civil Defense Research Staff has conducted eight experimental shelter occupancy tests. In addition to the early two-week tests involving 30-person groups, there have been three 300-person tests conducted (see Table 1).

In 1965, two 300-person occupancy tests were proposed, approved, and subsequently implemented. The first was a one-week test involving men, women, and children aged 2 to 67 years. The primary purpose of this study was to test the use of a shelter handbook without a trained shelter staff. Shelter Organization variables studied were staff/shelteree ratio, size of sections within the total groups, command structure, emergent leadership, and experimental shelter handbook. Shelter Activity variables included training lectures, sleeping arrangements, supply distribution, and exercise and recreational activities. Shelter Environment variables included space, temperature and humidity, water and food rations, sanitation, and standard stocked OCD equipment and supplies. Subjective and objective assessment of experimental conditions was obtained, as well as a film of the study. This study (Experimental Study VII) was implemented 19-26 June, 1965, and is discussed in this report.

Experimental Study*	Date	Shelterees				Shelter Environment				
		N	Sex	Age	Defections	Net Space/Person	sq. ft.	cu. ft.	Temp.	Hum.
ES I	14-18 Dec. 1962	30	Men, women, children	15-50	8	8	52	opt.	opt.	15 {20%
ES II	16 Feb.- 1 Mar. 1963	30	Men, women, children	9-67	5	8	52	opt.	opt.	Day: 40 Night:
ES III	27 Apr.-10 May, 1963	30	Men, women, children	7-66	2	8	52	opt.	opt.	Day: 40 Night:
ES IV	20-27 July 1963	30	Children, two adults	7-12	11	6	39	opt.	opt.	Day: 40 Night:
ES V	8-21 Feb. 1964	30	Men, women, children	7-70	8	8	52	opt.	opt.	Day: 40 Night:
ES VI	31 July- 2 August 1964	300	Men, women, children	3-66	0	10	—	opt.	opt.	MRD V
ES VII	19-26 June 1965	307	Men, women, children	2-67	?	10	—	warm	mod.	Natural
ES VIII	10-12 Sept. 1965	321	Men, women, children	1-67	8	10	—	warm	mod.	Natural

\*ES I - ES IV were presented in the 1962-63 Final Report.

ES V - ES VI were presented in the 1964 Final Report.

†Ss requested to consume as few rations as possible.

‡OCD stocked supply consumption. Food and water brought in by Ss not inventoried.

§Brought by some, not all Ss.

||Brought by very few Ss.

A

## EXPERIMENT

Environment				Shelter Supplies		
	Hum.	Ventilation cfm/person	Water qt/person/day Consumed	Food cal/person/day Consumed	Sanitation	Bunks
20% : 40 nt: : 40 nt: : 40 ht: : 40 ht: D Ve ural ural	opt.	15 (20% fresh air)	1.3 <sup>b</sup>	315 cal. <sup>b</sup> Bulgur wafer	Chemical toilet	No
	opt.	Day: 40 (20% fresh air) Night: 15 (20% fresh air)	1.4 <sup>b</sup>	787 cal. <sup>b</sup> Bulgur wafer	Chemical toilet	No
	opt.	Day: 40 (20% fresh air) Night: 15 (20% fresh air)	1.0 <sup>b</sup>	814 cal. <sup>b</sup> Nabisco biscuit	Chemical toilet	No
	opt.	Day: 40 (20% fresh air) Night: 15 (20% fresh air)	1.0	552 cal. Nebraska cracker + 296 cal. carbo suppl. = 848 cal.	Chemical toilet	No
	opt.	Day: 40 (20% fresh air) Night: 15 (20% fresh air)	1.0	808 cal. (Bulgur wafer, Nabisco biscuit, Nebraska cracker, carbo suppl.)	Chemical toilet	No
	opt.	MRD Ventilation Tests	1.0	306 cal. Nebraska cracker + 208 cal. carbo suppl. = 514 cal.	Chemical toilet	No
	mod.	Natural plus window fans	1.2 <sup>c</sup>	776 cal. <sup>c</sup> Cracker and carbohydrate suppl.	Chemical toilet	Cots, sleep and bla
	mod.	Natural plus window fans	.8 <sup>c</sup>	655 cal. <sup>c</sup> Cracker and carbohydrate suppl.	Chemical toilet	Cots, sleep and bla

B

**TABLE 1**  
**EXPERIMENTAL SHELTER OCCUPANCY VARIABLES**

Shelter Supplies								
s	Food cal. <sup>b</sup> consumed	Sanitation	Bunks	Blankets	Bath Water	Coffee	Cig.	Recreational Supplies
	cal. <sup>b</sup> Bulgur wafer	Chemical toilet	No	No	No	No	No	No
	cal. <sup>b</sup> Bulgur wafer	Chemical toilet	No	No	No	No	1 pk.	No
	cal. <sup>b</sup> Nabisco biscuit	Chemical toilet	No	No	No	No	1 pk.	No
	cal. Nebraska cracker + cal. carbo suppl. = 848 cal.	Chemical toilet	No	No	No	No	1 pk. adults	paper and pencils
	cal. (Bulgur wafer, Nabisco uit, Nebraska cracker, do suppl.)	Chemical toilet	No	No	No	No	1 pk.	No
	cal. Nebraska cracker + cal. carbo suppl. = 514 cal.	Chemical toilet	No	No	No	No	1 pk.	No
eep r d blan <sup>c</sup> cal. <sup>c</sup> Cracker and bohydrate suppl.	Chemical toilet	Cots, sleep mattresses, and blankets <sup>d</sup>		No	No <sup>e</sup>	Yes	Yes <sup>d</sup>	
eep d blan <sup>c</sup> cal. <sup>c</sup> Cracker and bohydrate suppl.	Chemical toilet	Cots, sleep mattresses, and blankets <sup>d</sup>		No	No <sup>e</sup>	Yes	Yes <sup>d</sup>	

The second 300-person occupancy test involved men, women, and children, aged 1 to 67 years. In addition to the replication of some experimental variables of ES VII, other variables were introduced. A brief pre-study orientation talk was given the sheltrees to motivate the assumption of duties necessary for successful self-management. The Handbook was revised to correct inefficiencies noted in the previous test. Some parts were completely rewritten, e.g., Radiological Monitor's instructions, to improve the understanding and learning of such vital tasks. An Emergency Operating Center Program was initiated for the first time, to evaluate shelter management problems and liaison with EOC. Improved sanitation procedures were also emphasized in this test, as well as proper utilization of shelter supplies. This study, Experimental Study VIII, was conducted 10-12 September, 1965, and is also presented in this report.

Prior to these main experimental tests, an overnight pilot study was conducted on 2 April, 1965, involving 223 men, women, and children, aged 2-66 years. The purposes of this study were, in preparation for ES VII, to (1) check out various phases of a shelter handbook, (2) determine SM staff formation procedures, (3) establish data collection procedures, (4) check out the research facilities, and (5) determine filming procedures.

## Chapter 3 - Experimental Design. (ES VII)

A summary outline of the experimental design for Experimental Study VII is presented below.

### I. Shelter Management

Test the following aspects of the Shelter Handbook:

- A. The SM staff structure proposed in the 1964 Final Report.
- B. The implementation of the entry, transition, and permanent phases of staff management as now proposed in the Handbook.
- C. The proposal of training alternate staffs during confinement.
- D. Content of the in-shelter program, both activity and training, as outlined in the Handbook and Guide to Shelter Living and Training (the supplement).

### II. Shelter Environment and Supplies

- A. Study problems involved in the use of a multi-chambered shelter, e.g., space utilization.
- B. Test the sanitary vault designed by the U.S. Army Engineer Research and Development Laboratories.
- C. Study effects of natural shelter ventilation and temperature on management and on sheltterees.
- D. Study sanitation problems, e.g., commode use, food and water supply use, and general cleanliness.
- E. Continue OCD stocks evaluation.

### III. Shelteree Characteristics

- A. Probe medical effects of a one-week confinement test on volunteer sheltterees who have been screened by medical history criteria rather than by a prior physical examination.
- B. Evaluate medical effects of a one-week confinement period on young children below the age of 7 years.
- C. Explore the use of lower age limits, e.g., 2-year-olds, in a one-week confinement test, preliminary to planning future infant studies.

- D. Study the kinds of supplies that shelterees might bring with them into a community shelter.



#### IV. Experimental Aspects

- A. Evaluate the "shadow" technique of observation, i.e., the untrained SM staff "shadowed" by a trained SM staff.
- B. Further develop shelteree reaction evaluation techniques, e.g., diaries and questionnaires.
- C. Determine pre-shelter processing procedures.

## Chapter 4 - Shelteree Staff Management

### I. Shadow Staff Selection

In the selection of a shadow staff for ES VII, interviews were held to evaluate appearance, alertness, ability, initiative, qualification, and interest. The resultant shadow staff consisted of graduate students from the University of Georgia, teachers from local schools, professional people, and military officers, all of whom possessed college degrees (see Table 2).

In determining respective shadow staff assignments, re-evaluations of each staff member were made. The most qualified person for a particular shadow staff position was selected for that position.

### II. Shadow Staff Training

#### A. Purpose of Training

The shadow staff were to evaluate the structure of the Handbook and evaluate the shelteree staff's use of the Handbook.

The training program included the following areas: Civil Defense Shelter Program, shelter living, Shelter Handbook, shadow techniques, and shadow evaluation procedure.

#### B. Method of Training

The shadow staff members were lectured as a unit. Two six-hour training sessions involved formal instruction. In addition, each shadow staff member was given the Handbook to study in entirety for a three-week period. One week before the study each staff member was told the staff position he would be shadowing; he then concentrated further study on that position.

In the two training sessions the following topics were discussed:

- (1) Need for a shelter program
- (2) Present United States shelter program
- (3) Present CDR study and experimental variables
- (4) Shelter living
- (5) Shelter organization
- (6) Shadowing technique and data collection
- (7) Handbook
- (8) Shelter facilities and walk-through
- (9) Stocked supplies

Table 2

**Shadow Staff Characteristics  
(ES VII)**

Shadow Staff Position	Age	Background	OCD Training
<b>Shelter Manager</b>	26	Graduate Student	Radiol. Monitors Course
<b>Assistant Shelter Manager</b>	25	Graduate Student	None
<b>Director of Operations</b>	28	Graduate Student	Taught CD Course in the Army Reserve
			None
<b>Director of Supply and Maintenance</b>	31	Navy Officer	None
<b>Director of Radiological Monitoring</b>	34	Ph.D. in Mathematics, Teacher	Radiol. Monitors Course
<b>Director of Training</b>	39	Masters Degree in Mathematics	CD Traffic Course
			None
<b>Director of Activities</b>	24	Teacher	None
<b>Section Leader (1)</b>	46	Retired Army Officer	None
(2)	21	Graduate Student	None
(3)	22	--	None
(4)	24	Graduate Student	None
(5)	21	Graduate Student	None
(6)	22	Teacher	None
(7)	24	Graduate student	None

To conclude training, a fifteen-minute individual conference was held with each shadow staff member three days prior to the study to ensure knowledge of his duties and responsibilities.

### III. Shelters Staff Selection

The temporary, permanent, and alternate shelteree staffs were to be composed of shelterees who had received no training from CDR. Participation on these staffs was voluntary. The methods of obtaining these staff members differed.

#### A. Temporary Phase

A sign placed on the front door of the shelter read: "FIRST MALE ADULT IN THE SHELTER: GO TO THE SUPPLY AREA AND PICK UP THE RED BOX. FOLLOW THE INSTRUCTIONS ON THE FRONT OF THE BOX. A MAP OF YOUR SHELTER AND THE NUMBER OF PEOPLE IT WILL HOLD ARE ON THE BACK OF THE BOX."



Instructions on the front of the Handbook directed the temporary Shelter Manager to pass out job pamphlets to male or female adults next entering the shelter. Inside each pamphlet was a primary instruction: "If you do not wish to do this job, return these instructions to the person from whom you received them." If the shelteree kept the pamphlet, he automatically became a member of the temporary shelteree staff.

#### B. Permanent Phase

The last duty of the temporary staff was to select a permanent staff from data to be obtained from the Shelteree Information sheets. This information was to include shelteree occupations and skills. These qualifications were to be matched, when possible, with the suggested criteria of experience for each job in the permanent phase. The qualified shelterees were then to be asked to accept jobs. If

willing, they were to receive instruction leaflets containing duties of the permanent shelteree staff.

C. Alternate Staff

The permanent shelteree staff, with the exception of Section Leaders, were told in the supplement to choose their own replacements. Again the data on the Shelteree Information sheets were to be used in these selections. Each alternate staff member was to act as assistant to his counterpart on the permanent staff for at least one day, preferably the day after entry. The alternate staff were then to be given their instruction leaflets from the Handbook to study. The alternate staff were to assist the permanent staff and gradually assume shelter supervision for short periods of time. Once training was completed, the permanent and alternate staffs were to rotate their shifts to relieve each other.

No alternate Section Leaders were to be chosen. Instead, the sections were to be collapsed to half the original number, thus affording two Section Leaders for each new section, and allowing a rotation in the supervision of the sections.

## Chapter 5 - Publicity and Recruitment

Obtaining the necessary number of volunteer shelter participants involved various phases of publicity and recruitment.

### I. Publicity

Prior to ES VII, two news releases were prepared and distributed to the news media in Athens, Georgia, and surrounding areas. A "Door to Survival" folder, citing the need for volunteers and presenting an cutline of the study, was distributed to various groups and individuals. CDR coordinated with the University's Public Relations Department in news coverage. Also, members of the Civil Defense Research staff addressed numerous groups in and around the Athens area. The town of Washington, Georgia, forty-three miles from Athens, responded with a large group of volunteer sheltrees, headed by the local CD Director. Several articles appeared in the town paper, the "Washington News Reporter," in connection with the ES VII experiment.

To secure competent, well-educated personnel to serve as shadow staff members, an advertisement for graduate students was placed in the University of Georgia campus newspaper, "The Red and Black."

A fact sheet entitled "The Fallout Shelter Occupancy Research Project, Athens, Georgia, June 19-26, 1965, Conducted by Civil Defense Research Staff of University of Georgia for the Office of Civil Defense, Department of Defense," was written by the Public Information Office in the Pentagon. The fact sheet was to be used only in the event of inquiries by news media. As a result of such inquiries, the fact sheet was released at the termination of the study and articles based on it appeared in the following newspapers: "The Atlanta Constitution," "The Atlanta Journal," "The Atlanta Times," "The Athens Banner Herald," and "The Athens Daily News." In addition, WSB radio in Atlanta, Georgia, and all radio stations in Athens, Georgia, reported the story in regularly scheduled newscasts.

Also, ten Civil Defense Directors within the state were notified of the research effort and invited to observe ES VII.

### II. Recruitment

Letters and post cards were sent to applicants on file to determine their availability for ES VII and to offer the members of an applicant's family an opportunity to apply. The large numbers of teen-age and pre-teen applicants were informed that their chances of selection would be greater if accompanied by one or more adults.

The 307-person shelter group consisted of men, women, and children in the age range of 2-67 years. Fifteen shadow staff members, 12 males

and 3 females, were included in the total group. Shadow staff members performed as observers and were not permitted to accept temporary or permanent shelter management task assignments. The 307-person group also included a doctor and a nurse. Two-person teams, each composed of one doctor and one nurse, worked eight-hour shifts.

Eighty per cent of the shelteree group was composed of family units and 20% were individuals without other family members. (For a comparison of the ES VII group with the 1960 census see Table 3.) Forty-six per cent of the shelterees were those whose applications were already on file and had not participated in previous tests. Twenty-seven per cent were members of a volunteer group of citizens from Washington, Georgia, and the aforementioned specially recruited shadow staff and medical personnel. The remaining 27% were new applicants who had requested applications by phone or letter.

Recruited shelterees submitted a detailed medical history questionnaire for evaluation prior to selection for the study. On the day of shelter entry all shelterees filled out Medical Inquiry Referral Forms to determine current state of health. Medical examinations were given at this time to anyone who listed a current ailment which might adversely affect that person or others as a consequence of confinement, along with all shelterees 50 years of age and older and 10 years of age and younger.

Table 3  
**Shelteree Characteristics**  
 (ES VII)

Item	U. S. Census (1960)	ES VII
Number of Shelterees		307
Age Range		2-67 years
Average Age	29.5 years (Median)	15 years (Median) 20.3 years (Mean)
Average Education	10.6 years (Median)	11 years (Median) <sup>a</sup> 11.7 years (Mean) <sup>a</sup>
Sex	49.3% Males 50.7% Females	45.3% Males 54.7% Females
Race	88.57% White 10.53% Negro 0.90% other	Not integrated

<sup>a</sup>Shadow staff not included.

## Chapter 6 - Pre- and Post-Shelter Processing Procedures

### I. Pre-Shelter Processing Procedures

The processing area for ES VII was the University of Georgia Coliseum. The arena section of the Coliseum was divided into four stations to facilitate the processing. At 9:00 A.M. shelterees began entering the building. Each person's name was checked against a previously prepared list. From this point they were escorted to Station I.

#### A. Station I (Medical Inquiry)

Medical Inquiry Referral Forms were administered to all shelterees. All persons 50 years of age and over, or 10 years of age and under, were required to take a medical examination. After filling out the Medical Inquiry Referral Form, the shelterees were either escorted to the medical booths (Station II) or ushered to Station III.

#### B. Station II (Medical Examinations)

Five physicians directed these examinations. Using the information from Medical Inquiry Referral Forms and their own examinations, the physicians determined whether or not the person should be allowed in the shelter experiment. No shelteree was rejected for medical reasons on the day of the study.

#### C. Station III (Photography and Possession Inquiry)

Processing at this station was divided into two phases. Each shelteree was photographed with an identification number. Each picture, name, and number was recorded. After photography, each of the first 150 adults was given a Possession Inquiry Form. In a few instances the head of a family completed one form for all family members, so that the sample consisted of a total of 176 persons. The Inquiry Form included a complete listing of all items the shelterees brought to the shelter.

#### D. Station IV (Pre-Shelter Questionnaire and Project Director's Address)

After all shelterees and standbys had been photographed and had finished filling out the Possession Inquiry Form, the last phase began. Children under 14 years of age were shown a movie; Pre-Shelter Questionnaires were distributed to all shelterees and standbys 14 years of age and older. The questionnaires were of two types, one given to those who were single and who had never been married, and the other to those who were married or who had been married. The purpose of this questionnaire was to probe for possible predictors of emergent leadership, defections, etc.

At the completion of this questionnaire, the Project Director gave a short address in which he commended the shelterees on their patriotic participation and informed them of the national significance of the study, and thanked them for their cooperation.

E. Transportation to the Shelter

Shelterees were escorted from the Coliseum bleachers to buses which shuttled back and forth to the shelter.

II. Post-Shelter Processing Procedures

On completion of the study, and following the Project Director's remarks, the CDR staff entered the shelter to verify the final census count. Shelterees were then taken by bus to their cars at the Coliseum parking lot.

## Chapter 7 - The 300-Person Shelter Facility

The fallout shelter used for ES VII was located in a building in the downtown area of the city of Athens, Georgia. The experimental shelter area was located above ground on the first and second floors of the building. This area was designed to accommodate 300 sheltrees, allowing 10 sq. ft. of floor space per person. The first floor consisted of approximately 2,000 sq. ft. (300 sq. ft. in each of the two front rooms, and 1,400 sq. ft. in the main area--see Figure 1). The second floor shelter area consisted of about 1,000 sq. ft. Temporary walls of 1/4-in. plywood were installed to restrict the total shelter area to 3,000 sq. ft.

With the exception of the floor of Room A (see Figure 1), which was wood, all the floors were concrete. The ceiling on the first floor was 12.5 ft. high; the ceiling on the second floor 10 ft. high.

Locations of one-way observation ports and camera positions in the observation area, and locations of toilets, light switches, and fans within the shelter area are shown in Figure 1.

The office and control room was situated at the rear of the building on the first floor. This space occupied about 280 sq. ft. (20' x 14'). The controls for the various recording instruments were located in this room.

The illumination of the shelter area was considered adequate. Main lighting was provided by 16 fluorescent ceiling lights, each approximately 170 watts. Night lighting was furnished by one or two 15-watt lamps in each room. Camera lighting was provided by 34 200-watt incandescent bulbs, for use only during filming.

Nine fans were used for ventilation in ES VII. Three were exhaust fans only and were located in the observation areas outside the shelter. Five of the fans were located at various points within the shelter area and were reversible, with three intake speeds and three exhaust speeds. One of the fans inside the shelter was a small floor fan. The capacities of the larger fans are shown in Table 4.

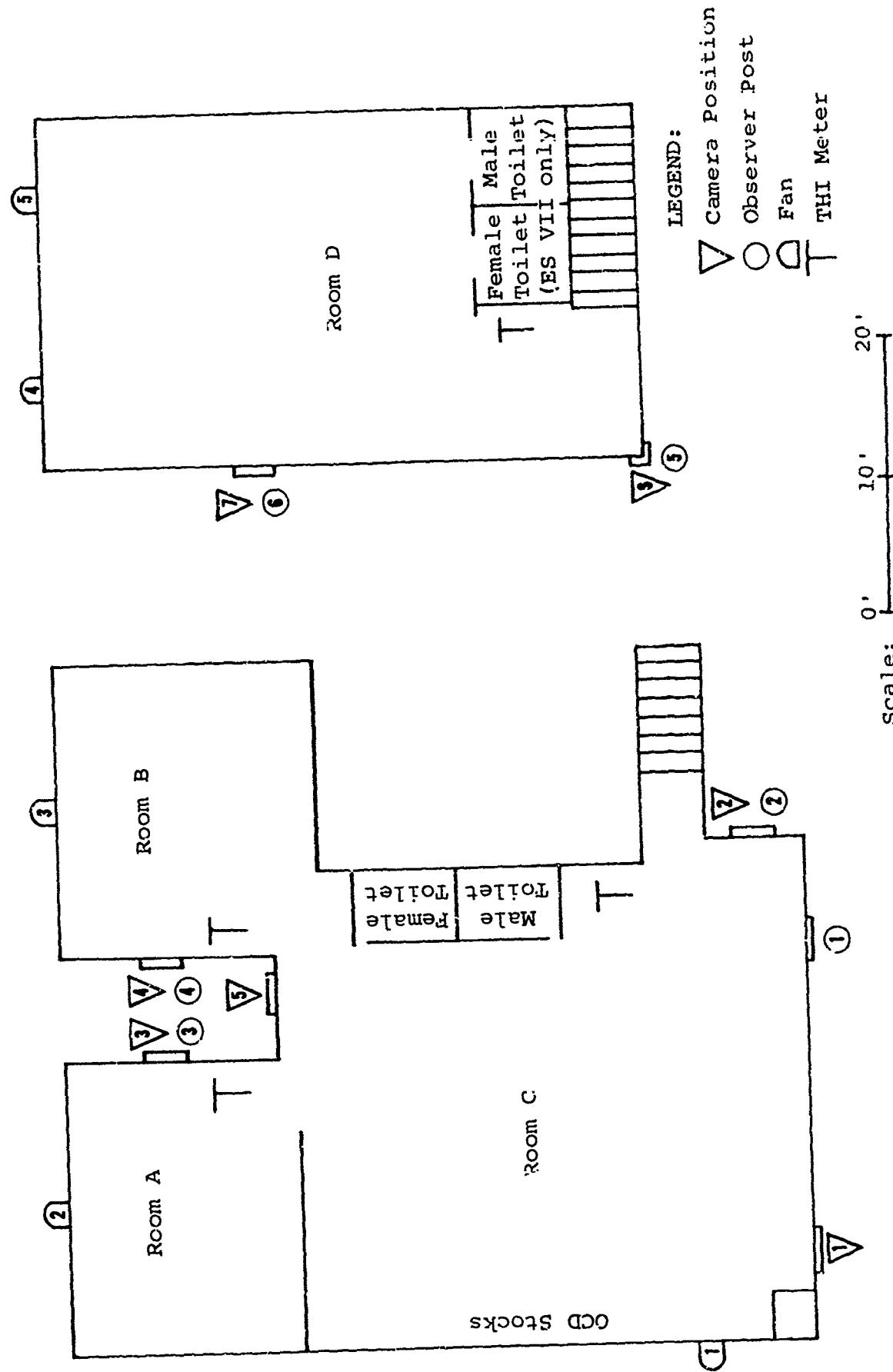


Figure 1. The 300-Person Shelter (ES VII and ES VIII).

Table 4

Fan Characteristics  
(ES VII)

Quantity	Size	Type (Model)	"0" Static Capacity (CFM)	Total CFM
5	20"	Window (9025)	4,000	20,000
1	24"	Attic (6391)	5,400	5,400
1	30"	Attic (6392)	7,800	7,800
<u>1</u>	42"	Attic (6394)	12,000	<u>12,000</u>
8			Total	45,200
		less 10% (static pressure and drag)	<u>4,520</u>	
			40,680	

### I. Medical Coverage on Day of Entry

When the potential sheltrees reported for the shelter study, they were given a medical form to complete. Sheltrees 10 years of age or younger, and 50 years of age or older, were routinely referred to a physician for a check-up. There were 90 routine referrals. Anyone with a medical condition of such nature to endanger other people during the shelter stay, or be complicated by the shelter stay experience, was referred to a physician for further evaluation, and designated a non-routine referral.

From Table 5 it may be seen that of all the reasons for non-routine referrals, colds accounted for eight, the greatest number. Females had more non-routine referrals than males, 23 as opposed to 5. The age group with the most non-routine referrals was the 11-19 age group, with 11 referrals.

One physician requested a corroborative evaluation from another about a child with a heart defect. The consensus was to accept her as a sheltree, and she subsequently stayed the entire week without medical complications. Indeed, none of the potential sheltrees was rejected as being medically unfit for shelter confinement.



### II. Pre-Shelter Questionnaire

Prior to shelter entry sheltrees were given a questionnaire in an attempt to learn more about the characteristics of the group and to possibly correlate some factors with defections. A Personal Possession Inquiry was also given, the results of which are included in the discussion of defections.

Detailed Pre-Shelter Questionnaire information is presented in Appendix A, Tables A-1 to A-12. Some primary observations were:

- A. Single people listed more outside-the-home activities than married people.

Table 5  
Reasons for Medical Referral c Day of Entry  
(ES VII)

Reason	Sex	Age					
		0-10 N=82	11-19 N=11	20-29 N=1	30-39 N=6	40-49 N=4	50-59 N=8
Routine	Male	<u>35</u> <sup>a</sup>	0	0	0	0	<u>2</u>
	Female	<u>41</u>	0	0	0	0	<u>6</u>
Hayfever	Male	0	0	0	0	0	0
	Female	<u>1</u>	0	0	0	0	0
Skin Infection	Male	0	0	0	0	0	0
	Female	<u>1</u>	0	0	0	0	0
Cold	Male	0	<u>2</u>	0	0	0	0
	Female	<u>1</u>	<u>2</u>	0	<u>2</u>	<u>1</u>	0
Measles	Male	0	0	0	0	0	0
	Female	<u>1</u>	0	0	0	0	0
Heart	Male	0	0	0	0	0	0
	Female	<u>1</u>	0	0	0	0	0
Acne	Male	0	0	0	0	0	0
	Female	0	<u>1</u>	0	0	0	0
Asthma	Male	0	<u>1</u>	0	0	0	0
	Female	0	<u>2</u>	0	<u>2</u>	0	0

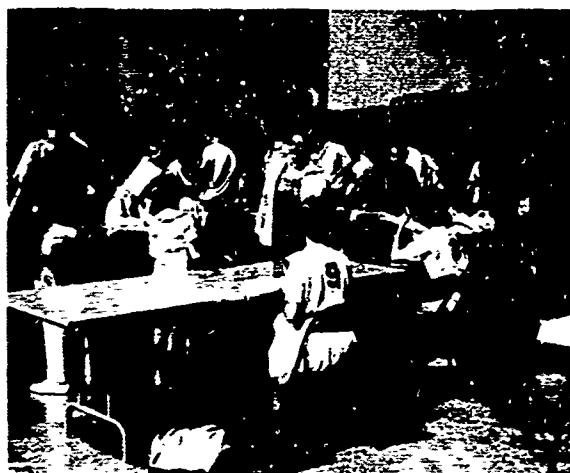
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Table 5 (Contd.)

Reason	Sex	Age					
		0-10 N=82	11-19 N=11	20-29 N=1	30-39 N=6	40-49 N=4	50-59 N=8
Toothache	Male	0	0	0	0	0	0
	Female	0	<u>1</u>	0	0	0	0
Earache	Male	0	<u>1</u>	0	0	0	0
	Female	0	0	0	0	0	0
Broken Hand	Male	0	<u>1</u>	0	0	0	0
	Female	0	0	0	0	0	0
Allergy	Male	0	0	0	0	0	0
	Female	0	0	<u>1</u>	<u>1</u>	0	0
Medication	Male	0	0	0	0	0	0
	Female	<u>1</u>	0	0	0	<u>1</u>	0
Sinus	Male	0	0	0	0	0	0
	Female	0	0	0	0	<u>1</u>	0
Sciatic Nerve	Male	0	0	0	0	0	0
	Female	0	0	0	0	<u>1</u>	0
Fainted Recently	Male	0	0	0	0	0	0
	Female	0	0	0	<u>1</u>	0	0

<sup>a</sup>All frequency counts are underlined.

- B. Most single people were students, while most married people were semi-skilled workers or housewives.
- C. Most single people earned less than \$100 in 1964.
- D. When asked their favorite newspaper sections, single people listed funnies, front page, and sports; while married people listed news, front page, and editorials.
- E. Most married people had an income in the \$5,000-\$7,500 range with the next most frequent group being \$2,500-\$5,000 range.
- F. Both single and married people listed church as the group outside the home which interested them the most.
- G. A majority stated they attended this group once a week.
- H. Both single and married people in a ratio of about 3 to 1 answered, yes, they read a newspaper regularly.
- I. Most people listed fewer than nine close friends.
- J. Most people watched TV.
- K. Most people watched TV between one and three hours per day.



### III. Civil Defense Information

Prior to shelter entry, 170 shelterees over 14 years of age completed a Civil Defense Information Questionnaire. Not every person answered every question. As will be seen, the majority of shelterees were not adequately prepared for emergencies. Detailed data are given in Appendix A.

- A. Question I: Do you have a family fallout shelter?

None of the 76 single Ss who gave responses to this item indicated possession of a family fallout shelter, and only 3.5% of 85 married Ss gave affirmative responses. Of the total 161 Ss, married and single combined, 1.8% answered affirmatively.

B. Question II: Have you gone to Civil Defense classes?

In the group of 76 single Ss, 5% indicated that they had attended Civil Defense classes. Affirmative responses in the group of 86 married Ss were given by 8%. Of the total of 162 Ss, 6.7% gave affirmative responses.

C. Question III: Do you know where there is a community fallout shelter for you and your family?

Forty-seven per cent of 85 single Ss indicated knowledge of community fallout shelter locations, and 43.5% of 85 married Ss. Of the 170 total Ss, 45% were aware of these locations.

D. Question IV: Do you have emergency supplies of food and water in your home?

Of the 75 single Ss, 9% indicated possession of emergency supplies of food and water in their homes, but the percentage of affirmative responses was much higher for the married category of 86 Ss. Twenty-three per cent of the responses in this group indicated home emergency supplies of food and water. This difference in percentage between the two groups could possibly be attributed to the referral by married people to the common pantry supplies as emergency supplies. Of the total 161 Ss, 16.7% gave affirmative responses.

E. Question V. Do you have emergency supplies of medicine and first aid in your home?

From the single group of 76 Ss came 61.8% affirmative responses and from the 85 married Ss, 50.5%. Of the total 161 Ss, 55.9% indicated emergency supplies of medicine and first aid equipment available at home.

## I. Shelteree Staff Organization

The temporary phase of shelter entry was the formative stage in the establishment of a shelter management staff. The Handbook suggested the following positions as being necessary to create an operational staff: Shelter Manager (SM), Assistant Shelter Manager (ASM), Census Taker (CT), Director of Security (DS), Medical Man (MM), Director of Supply and Maintenance (DSM), Director of Operations (DO), Water Supply Guard (WSG), Equipment Supply Guard (ESG), Door Guard (DG), Traffic Director (TD), Window and Door Closer (WDC), Head of Fire Control Team (HFCT), Commode Monitors (CM), Radiological Monitor (RM), Communications Man (CoM), and Section Leaders (SL). Four of these positions--DG, TD, CM, and SL--have varying job qualifications. The number of DGs and TDs is dependent on how many doors there are into the shelter; the personnel necessary for CMs depends on the number of Commode Areas; and the number of SLs needed varies with the number of shelter occupants. For a 300-person occupancy study, 28 staff personnel, of whom 12 would be SLs, were recommended for the temporary phase.

The first adult male into the shelter was to be the SM. As such, he was to pass out, to people who would accept them, labeled envelopes containing instructions for temporary staff positions. The sex, age, and position name was indicated on the front of the envelopes, e.g., DO, adult male. To some degree then, the SM chose his temporary staff.

However, in ES VII the temporary SM did not utilize the recommended number of personnel for his staff. Room leaders, rather than SLs, were used in the four shelter rooms. This method of designation created a problem of apportionment. The two largest rooms contained more people than one person could effectively control. The exact number of people on the temporary staff could not be determined by observation, but it was less than the recommended number. The recommended ratio of SLs to shelterees (Ss) is 1 to 25-30. The temporary phase had a ratio of approximately 1 SL to 74 Ss.

In the transition from the temporary phase to the permanent phase a permanent staff (see Figure 2) was to be selected by temporary staff personnel. This selection committee was to consist of the SM, ASM, CT, DS, and WDC. This group, utilizing the Shelteree Information sheets as source material, was to choose the best qualified person for each staff position. However, the selection committee in ES VII did not follow the suggested composition. The temporary SM apparently did not read his instructions thoroughly.

Furthermore, certain criteria were listed for the various staff positions. However, most of the selected permanent staff did not meet the suggested requirements. The qualifications listed for the SM were

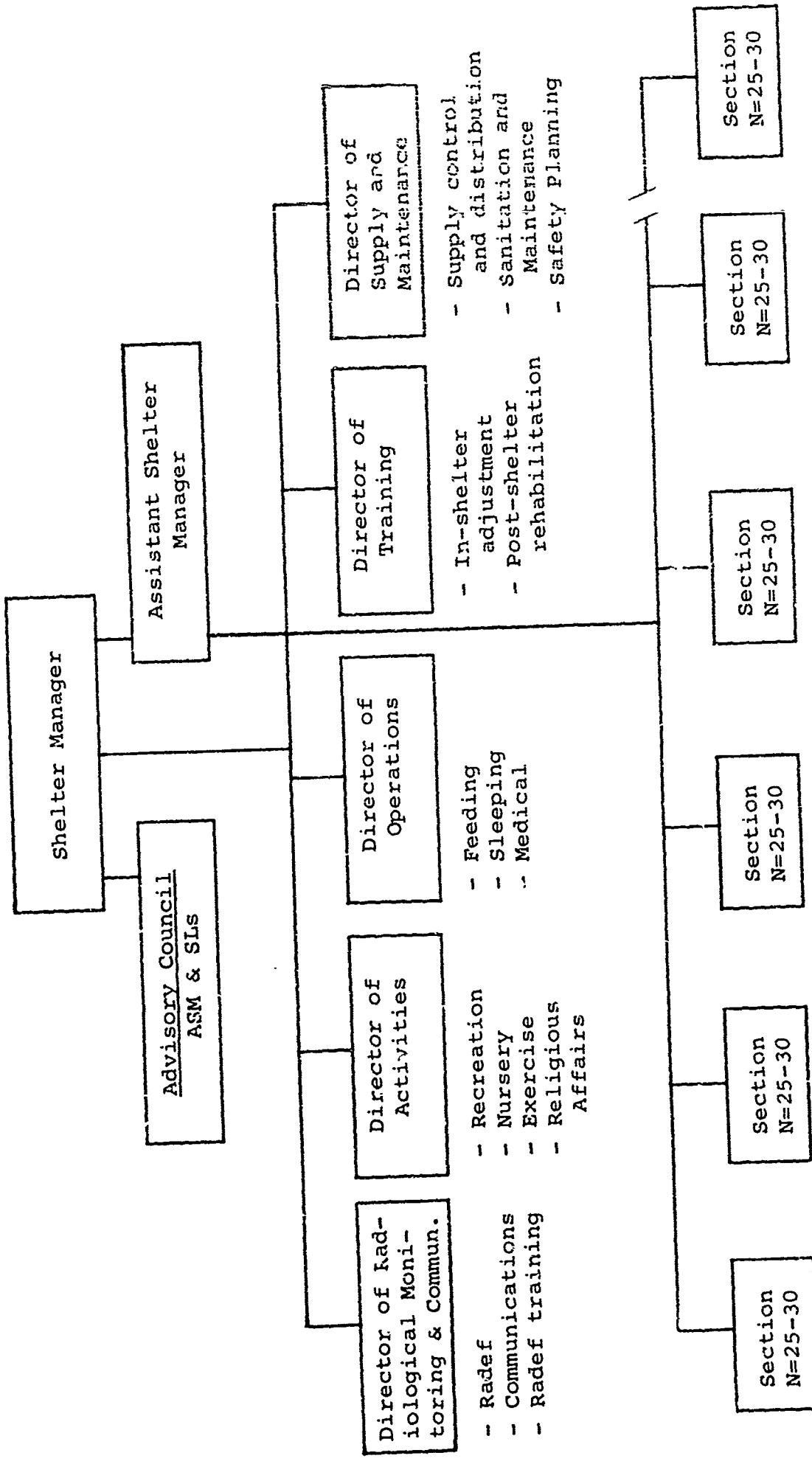


Figure 2. Proposed Permanent Shelteree Staff Organization.

leadership ability and administrative experience; this position was filled by a person who had these qualifications, a 32-year-old man who was the manager of a local finance company branch office. The position of ASM listed the same qualifications as the SM; however, the person in this position, a 36-year-old utility operator, lacked the requisite qualifications.

Both the DA and the DT were female teachers, whereas the Handbook had suggested adult men for these positions. The DO, a highway department foreman, met his job description, and the DSM, an insurance adjuster, although not having prior supply handling experience, did have some experience in management. The RM was a graduate student with sufficient technical background for the position.

The medical staff, pre-selected and briefed by CDR, consisted of one doctor and one nurse for each 8-hour period. The three medical teams worked in such 8-hour shifts on a rotational basis.

The SL positions were to be filled by persons with leadership ability and administrative experience. However, in ES VII the SLs had various occupations--student to poultryman--and a wide age span--14 to 47.

## II. Shelter Handbook

### A. Temporary Phase

The temporary shelteree staff did not begin to function until approximately 40 minutes after entry. Shadow staff observations attributed this to the incompetence of the first male adult in the shelter, the temporary Shelter Manager (TSM). The TSM did not pass out the job instruction envelopes at the door as his information directed him, but instead kept the whole Handbook and read his instruction packet first, a procedure unnecessary in initiating shelter management. An additional factor was his apparent startle reaction to the close-up filming procedure used by the observational film crew. After approximately 30 minutes had passed, several other shelterees gathered around the TSM to help him decide on a course of action. The instruction envelopes were passed out and those shelterees receiving them began to read them.

Because of this delay all of the shelterees were in the shelter before management commenced functioning. Thus, many Handbook instructions concerning shelter entrance and formation of sections were not accomplished. As Table 6 and Figures 3 and 4 demonstrate, only 49% of the Handbook's temporary phase instructions were completed. The average rating on these completed items was 2.54, on a scale of 1 (Bad) to 5 (Good).

Table 6

## **Shadow Staff Evaluation of Shelter Leadership Performance (ES VII)**

Phase		SM	ASM	DO	DSM	DRMC	DA	DT	SL	Overall Averages for Each Phase or Day							
Temporary Phase		.22 1.66 <sup>a</sup>	.57 4.00	.69 3.57	.58 4.28	.2 1.00	X	X	.5 1.50	.5 3.00	.5 1.00	.33 3.50	.83 3.00	.33 2.00	.83 2.00	.50 --	.49 <sup>b</sup> 2.54 <sup>c</sup>
Transition Phase		.78 3.11															
Permanent Phase Saturday		.40 4.00	.18 --	-- 3.00	.17 4.00	-- --			.33 5.00	.53 3.11	.60 4.33	.06 --	.60 2.72	.46 3.33	0 --	.26 --	.33 3.69
Sunday		.46 3.57	.33 3.00	-- --	.29 2.00	.11 4.12	.50 5.00	.50 3.33	.67 --	0 --	.13 4.00	.73 4.14	.20 3.50	0 --	.67 --	.44 3.63	
Monday		.46 4.00	.60 2.16	-- --	.22 2.00	.23 3.50	.65 5.00	.16 3.09	.80 4.9	.67 --	0 --	.80 3.8	.53 3.16	.67 4.66	.60 --	.53 3.63	

Table 6 (Contd.)

Phase	GM	ASM	DO	DSM	DRMC	DA	DT	SL	SL	SL	SI	SL	SL	SL	Overall Averages for Each Phase or Day		
Tuesday	.26	.70	--	.29	.05	.30	--	.60	.66	0	.13	.80	.53	.80	.49		
	4.00	3.60	--	--	--	3.83	--	3.0	4.9	--	4.00	4.08	3.57	4.25	--	3.91	
Wednesday	.26	0	--	0	.05	.65	--	.73	.60	.13	.06	.93	.40	.80	.86	.50	
	3.00	--	--	--	1.00	4.00	--	3.0	4.88	3.0	2.0	--	3.0	4.33	--	3.13	
Thursday	.33	.10	--	.11	.29	.65	--	.73	.60	.06	.13	.86	.20	.73	.80	.43	
	4.00	--	--	--	--	3.00	--	3.75	4.77	3.00	2.5	3.0	2.5	4.7	4.0	3.52	
Friday	.40	0	--	0	--	.65	--	.73	.60	.06	.13	.86	.13	.66	--	.47	
	--	--	--	--	--	2.00	--	3.87	5.0	0	2.5	--	2.5	4.1	--	3.33	
Permanent Phase Means	.36	.38		.24	.17	.67		.33	.68	.62	.07	.10	.79	.35	.73	.66	.46
	3.22	2.92		3.00	2.25	3.40		5.00	3.30	4.48	3.00	3.00	3.54	3.08	4.40	4.0	3.55

a.Rating Key: 1-Bad, 2-Poor, 3-Fair, 4-Average, 5-Good.

b)Mean Percentage.

c)Mean Rating.

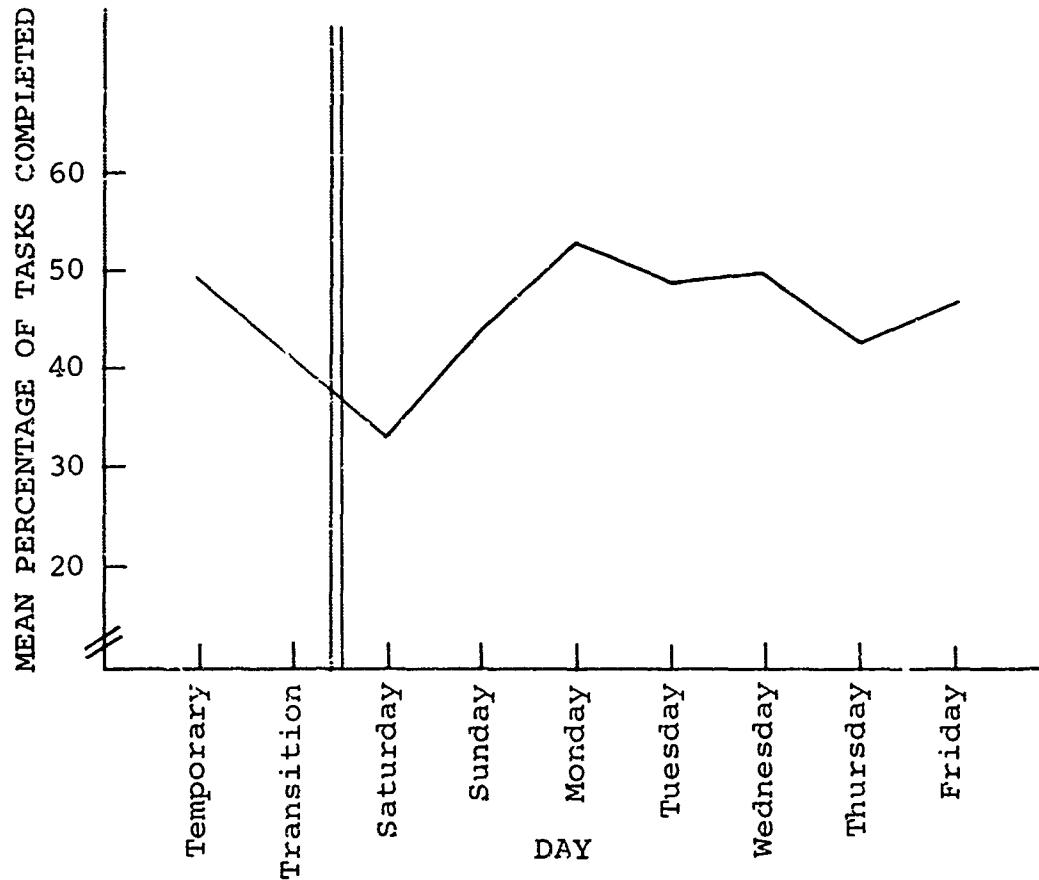


Figure 3. Percentages of Handbook tasks completed daily by the shelteree staff (ES VII).

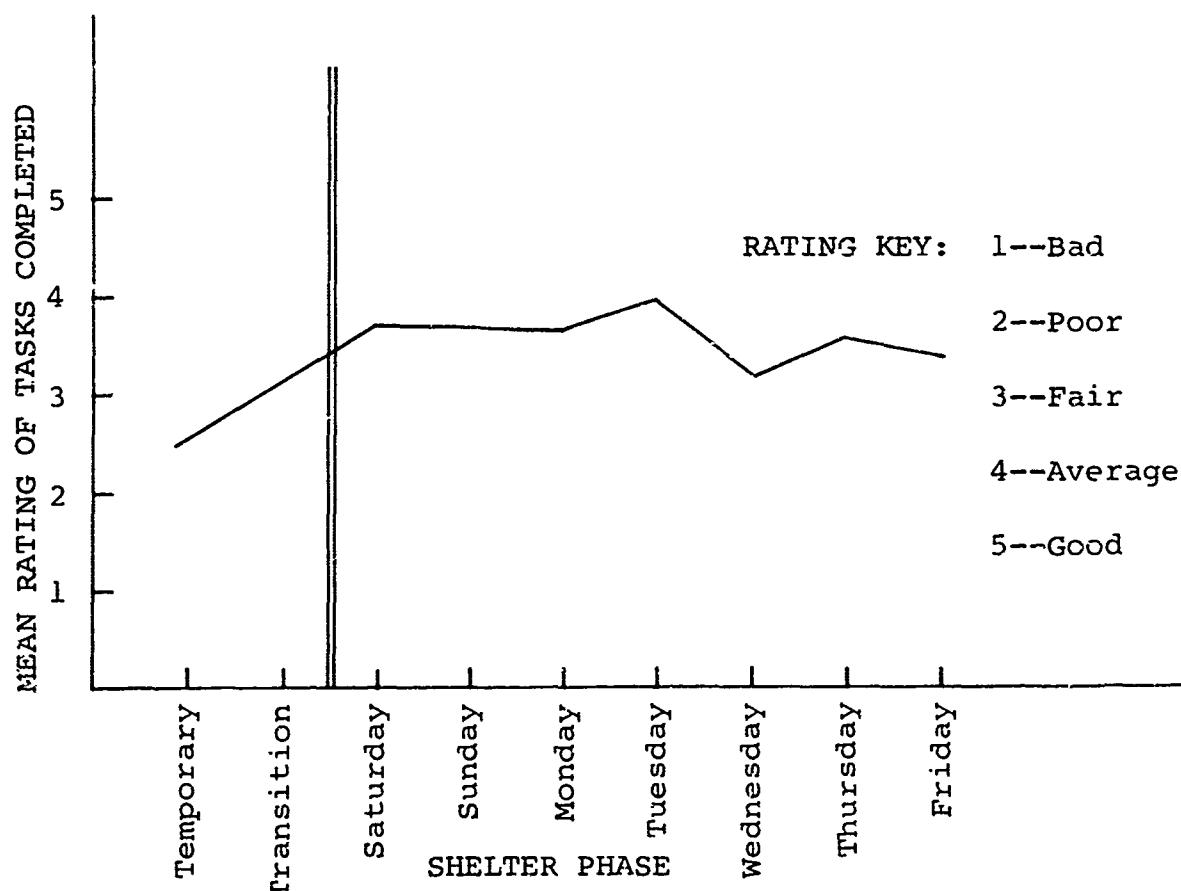


Figure 4. Rating of Handbook tasks completed daily by the shelteree staff (ES VII).

The Section Leaders varied from 5% to 83% completion of tasks. The Radiological Monitor had the lowest completion percentage (2%) of the temporary staff; however, the failure of the instrumented simulated radiological meter readings accounted for this. Table 6 indicates that the temporary Shelter Manager completed only 22% of his instructions, with a mean rating of 1.66.

Two Handbook forms were not used correctly. The Census Taker kept a count of incoming sheltrees on the instruction envelope rather than the Census Taker's Tally Sheet. Since the sheltrees were not counted as they entered, the Census Taker's total of 244 people was incorrect. There were 293 tallied from the Sheltree Information sheets. On the Sheltree Information sheets, approximately 75% of the requested data was entered. The categories of "Occupation" and of "Skills" were the most noticeably incomplete.

Table 7 gives a frequency distribution of the shadow staff's evaluation of staff structure. The data supported most of the Handbook recommendations, with the exception of the method for selecting staff members in the temporary phase.

Table 8 reflects the sheltree staff views on similar questions. Most questions were answered alike; however, the method of temporary staff selection was approved by the sheltree staff. Also the sheltree staff evaluation indicated more intra-staff cooperation than did the shadow staff evaluation.

The shadow staff and the sheltree staff also had differing opinions on their ability to survive in a shelter without a handbook. However, in addition to specific training on the Handbook and observation techniques, the shadow staff received training on the problems of shelter living, the reasons for the study, radiation effects, and the need for shelters. The shadow staff were especially recruited on the basis of their education, experience (see Table 2), and their ability to work independently. In contrast, the temporary sheltree staff were more of a random sample of the population with respect to education and ability to work independently. The shadow staff would be more likely to survive in a shelter without a handbook, since the selection criteria for them included many characteristics which would be of value in a shelter situation. On the other hand, a random sample from the general public would not be likely to include so many individuals with useful backgrounds, and these untrained people would tend to rely on a handbook.

#### B. Transition Phase

The transition phase began approximately four hours after shelter entry. This was at least two hours later than the predicted time for initiation of this phase, due to a lack of understanding

Table 7

Shadow Staff Evaluation of Staff Structure in the  
Temporary and Permanent Phases  
(ES VII)

Temporary Phase			Permanent Phase	
1. Do you feel that this position would be important in case of a real emergency?	<u>Yes</u> 13	<u>No</u> 1	<u>Yes</u> 13	<u>No</u> 1
2. Did the shelteree staff member you were shadowing have too much to do?	<u>Yes</u> 1	<u>No</u> 13	<u>Yes</u> 0	<u>No</u> 14
3. Were the Handbook instructions for this position easy to read and understand?	<u>Yes</u> 11	<u>No</u> 3	<u>Yes</u> 11	<u>No</u> 3
Did the shelteree staff member that you were shadowing have difficulty in reading and understanding any of the instructions?				
4. Did the instructions for this position fully describe the duties required?	<u>Yes</u> 8	<u>No</u> 6	<u>Yes</u> 6	<u>No</u> 8
5. Did the shelteree staff members work well with the other staff members?	<u>Yes</u> 12	<u>No</u> 2	<u>Yes</u> 11	<u>No</u> 3
6. Should the shelteree staff have been larger, smaller, or was it adequate?	<u>Yes</u> 8	<u>No</u> 6	<u>Yes</u> 12	<u>No</u> 2
<u>Larger</u> 2	<u>Adequate</u> 8	<u>Smaller</u> 4	<u>Larger</u> 1	<u>Adequate</u> 11
				<u>Smaller</u> 2

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(Contd.)

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Table 7 (Contd.)

Temporary Phase			Permanent Phase	
7. Did the other shelterees respect and recognize your shelteree staff member's authority?				
<u>Yes</u> 5	<u>No</u> 9		<u>Yes</u> 10	<u>No</u> 4
8. Do you like the manner in which the shelteree staff was selected?				
<u>Yes</u> 4	<u>No</u> 10		<u>Yes</u> 10	<u>No</u> 4
9. Do you think qualified shelterees would have volunteered to become staff members had they not been selected?				
<u>Yes</u> 10	<u>No</u> 4		<u>Yes</u> 8	<u>No</u> 6
10. Do you like the way your section of the Handbook was organized?				
<u>Yes</u> 10	<u>No</u> 4		<u>Yes</u> 11	<u>No</u> 3
11. Under emergency conditions would the instructions given for your staff position be adequate?				
<u>Yes</u> 10	<u>No</u> 4		<u>Yes</u> 12	<u>No</u> 2
12. Could you have survived in a shelter for two weeks (untrained) with three hundred people without a handbook?				
<u>Yes</u> 13	<u>No</u> 1		<u>Yes</u> 11	<u>No</u> 3
13. Do you think in-shelter shadowing is a good method to evaluate the Handbook and other shelter activities?				
<u>Yes</u> 10	<u>No</u> 4		<u>Yes</u> 13	<u>No</u> 1

Table 8

Shelteree Staff Evaluation of Staff Structure in the  
Temporary and Permanent Phases  
(ES VII)

	Temporary Phase	Permanent Phase				
1. Do you feel that your job would be important in case of a real attack emergency?	<u>Yes</u> 18	<u>No</u> 0	<u>Yes</u> 20	<u>No</u> 0		
2. Did you have too much to do?	<u>Yes</u> 0	<u>No</u> 18	<u>Yes</u> 2	<u>No</u> 18		
3. Were your instructions easy to read and understand?	<u>Yes</u> 14	<u>No</u> 4	<u>Yes</u> 18	<u>No</u> 2		
4. Did your instructions fully describe your duties?	<u>Yes</u> 16	<u>No</u> 2	<u>Yes</u> 20	<u>No</u> 0		
5. Did your staff work well together?	<u>Yes</u> 15	<u>No</u> 3	<u>Yes</u> 17	<u>No</u> 3		
6. Should your staff have been larger, smaller, or was it adequate?	<u>Larger</u> 1	<u>Adequate</u> 16	<u>Smaller</u> 1	<u>Larger</u> 3	<u>Adequate</u> 17	<u>Smaller</u> 0
7. Did the other shelterees respect and recognize your staff authority?	<u>Yes</u> 13	<u>No</u> 5	<u>Yes</u> 18	<u>No</u> 2		

(Contd.)

Table 8 (Contd.)

	Temporary Phase	Permanent Phase		
8. Did you like the manner in which you were selected to be a staff member?				
	<u>Yes</u> 15	<u>No</u> 3	<u>Yes</u> 18	<u>No</u> 2
9. Would you have volunteered to become a staff member had you not been selected?				
	<u>Yes</u> 10	<u>No</u> 8	<u>Yes</u> 13	<u>No</u> 7
10. Did you like the way your section of the Handbook was organized?				
	<u>Yes</u> 11	<u>No</u> 7	<u>Yes</u> 18	<u>No</u> 2
11. Under emergency conditions (war and bombing) would the instructions given you have been adequate?				
	<u>Yes</u> 14	<u>No</u> 4	<u>Yes</u> 16	<u>No</u> 4
12. Do you think you could have survived in a shelter for two weeks with three hundred people without a handbook?				
	<u>Yes</u> 10	<u>No</u> 8	<u>Yes</u> 9	<u>No</u> 11

by the temporary Shelter Manager. Also, the duration of the transition phase was longer than necessary, requiring about an hour to compile the data from the Shelteree Information sheets. Forty-five additional minutes were needed to select the permanent staff. Although the temporary Shelter Manager did not grasp the full purpose of the transition phase, he did complete 78% of his transition phase tasks.

### C. Permanent Phase

The major differences between the Handbook recommendations for staff structure in the permanent phase and what actually occurred in the staff structure were: (1) the sex, age, and experience of the permanent staff member, (2) the number of personnel used on the staff, (3) the composition of the selection committee for the permanent staff, and (4) the advisory council.

Only adult men were suggested for most staff positions. However, two female teachers served as DA and DT on the permanent staff, and two SLs were teen-agers. The teen-agers did not have sufficient experience to be good SLs. They were selected on the basis of necessity, since many adults, both male and female, refused to accept a position as SL.

The manner in which the temporary SM organized the shelterees into room groups influenced the permanent staff. Consequently, considerably fewer SLs were used than was advisable. The recommended ratio of SL to Ss was 1 to 25-30. During the entry phase the actual ratio was 1 SL to 74 Ss. The resultant sections were too large for one person to control effectively. Possible reasons for the insufficient number of SLs in the temporary phase are: (1) lack of understanding by SM of the importance of the SL, (2) lack of qualified people from whom to choose, and (3) reluctance of shelterees to volunteer and accept responsibility.

The permanent staff and the alternate staff each had seven SLs, a ratio of 1 SL to 42 Ss. Not enough emphasis was given to selecting capable people for the SL position in the permanent phase, possibly a reason for their mediocre job performance. The SLs' main problems in establishing their authority were: (1) adults did not respond to teen-agers, (2) shelterees failed to receive information, and (3) those appointed or selected did not exert leadership.

Table 6 and Figures 3 and 4 reflect the percentage of Handbook tasks completed in the permanent phase. The staff performed 33% of the tasks with a mean rating of 3.69.

A larger percentage of permanent staff members answered negatively to the inquiry of whether they would have volunteered for a

staff position if they had not been asked than to any other question. (See Table 8.) Most responded they wished to remain with their families. The shadow staff felt similarly. (See Table 7.)

#### 1. Shelter Map

The Shelter Manager attempted to draw an outline of the shelter area on the Shelter Map form. He included only four of the suggested twelve items on the map. Of the eight he neglected, four pertained to his shelter situation: fire extinguishers, nursery area, communications station, and radio-logical monitoring station.

#### 2. Suggested Shelter Schedule

There were three major deviations from the proposed shelter schedule by the shelteree schedule (see Table 9). The time for arising in the morning was changed from 7:00 A.M. to 8:00 A.M. Bedtime was set at 9:00 P.M., two hours earlier than suggested. Three mealtimes and three water breaks were used instead of the proposed four meals and two water breaks.

#### 3. Shelter Log

This form was used for a set of minutes of the staff meetings, although only four pages of notes were taken for the week's stay.

#### 4. Food and Water Calculations

The Director of Operations followed the calculation procedure in the Handbook except for one step. He changed the fourteen-day basis to a seven-day basis in order to coincide with the length of the study. This change, however, was corrected by a shadow staff member to conserve rations. Subsequent calculations provided four crackers (eight squares) per meal and six cups of water per day. Because no records were kept of food and water distribution, many shelterees received more than their calculated share.

#### 5. Security Watches

A Safety Watch was maintained, but no watch schedules were recorded. The watch standers did not patrol the whole shelter but remained at the smoking area on the stairs between the first and second floors. The Commode Monitors also functioned; however, they did not maintain a satisfactory level of sanitation in the Commode Areas. A Supply Watch and a Detention Watch were not used in the permanent phase.

Table 9  
Proposed Versus Actual Shelter Schedule  
(ES VII)

Proposed	Actual
7:00 A.M. - Arise; supplies distributed	7:00 A.M. -----
8:00 - Food and water	8:00 - Arise
8:30 -----	8:30 - Breakfast
9:00 - Staff meeting	9:00 -----
9:30 -----	9:30 - Exercise
10:00 - Water	10:00 - Water
11:00 - Training and nursery	11:00 - Training and nursery
12:00 P.M. - Food and water	12:00 P.M. -----
12:30 -----	12:30 - Lunch
1:00 - Rest	1:00 - Rest
2:00 - Training	2:00 - Rest
3:00 -----	3:00 - Water
4:00 - Food and water	4:00 -----
5:00 -----	5:00 -----
5:30 -----	5:30 - Supper
6:00 - Special activities	6:00 -----
6:30 -----	6:30 - Special activity
7:00 -----	7:00 -----
8:00 - Food and water	8:00 - Water
8:30 -----	8:30 - Vespers
9:00 -----	9:00 - Bedtime and lights out
10:00 - Water	10:00 -----
11:00 - Lights out	11:00 -----

## 6. Radiological and Communications Monitoring

Though no experimental radiological readings were wired into the shelter, the Radiological Monitor simulated both survey meter and dosimeter readings at various points in the shelter. He also monitored all incoming and outgoing sheltterees. A record was kept of all readings.

## 7. Section Leader's Selection Form of Assistants

No records were made of any use of this form. Whenever assistants were needed, the director concerned chose them himself.

### D. Section Size

The Handbook recommends that each section be comprised of 25-30 people. For a 300-person shelter, 10-12 SLs would be indicated.

In ES VII, the permanent and alternate staffs each had seven SLs. Each section was composed of about 43 persons. It seemed that only three or four of these seven SLs actually performed or attempted to perform their jobs. For all practical purposes, therefore, the shelter operated with only four SLs, one for each room. The configuration of the shelter, two floors with four rooms, undoubtedly influenced this kind of grouping. The problem inherent here is one of apportionment, since the rooms were unequal in size. Each small downstairs room contained about 35 people, the large downstairs room about 140 persons and the upstairs room about 90 persons. Consequently, the efficiency of the performance of the SL was greatly attenuated.

### E. Advisory Council

The Handbook suggests an advisory council be formed, to consist of the SLs and the ASM. Its purpose is to furnish the SM with information about problems confronting the sheltterees. The only power this council possesses is that of suggestion. The council is supposed to function in the following manner: (1) an individual with a problem, complaint, or suggestion goes to his SL, (2) the SL decides whether he can handle it at the section level or whether it is something that the SM should be apprised of, (3) if it is the latter, the SL contacts the ASM, (4) then the ASM decides when to have a meeting of all the SLs with the SM.

Unfortunately, the advisory council did not function in the shelter. It is not known whether this was due to the ASM or to the SLs' failure to stress the council, although the advisory council is mentioned in the instructions for both positions. Evidently, the ASM and the SLs did not completely read their instructions or deliberately chose to ignore the formation of a council.

## F. Alternate Shelteree Staff

The selection of this staff to relieve the permanent staff occurred on the fifth day of the study. The qualifications of the alternate staff members were not congruent with those mentioned as desirable. Their occupations are found in Table 10. Table 10 shows there were not many sheltrees having the desired qualifications of management and supply experience. Shadow staff members agreed there was more communication among alternate staff members than among the permanent staff. The alternate staff followed the daily shelter schedule adopted by the permanent staff.

### 1. Rationale for Alternate Staff

The reasons given for setting up an alternate staff are:

- (a) If a shelter is overcrowded, it may be necessary to operate the shelter in 8- or 12-hour shifts to insure sufficient sleeping space;
- (b) In case of accident or emergency, there would be trained staff members available to fill vacant positions immediately;
- (c) The regular shelteree staff members need rest from the continuous strain of shelter management.

The supplement recommends that the alternates for each staff position be selected from data on the Shelteree Information sheets previously filled out by the Ss within sections.

In ES VII, however, there was a delay in implementing an alternate staff organization, possibly because of the lack of emphasis in the supplement. Perhaps the supplement was regarded as being an optional guide to the Handbook. The Handbook itself did not emphasize the organization of an alternate staff, and the plan for the organization was included in the supplement in a section also presenting many suggested functions.

### 2. The Alternate Staff

The organization of an alternate staff was begun on Wednesday, 23 June, the fifth day of confinement. The alternate staff were selected by the permanent shelteree staff at 4:45 P.M. and were introduced to the sheltrees by the SM at 7:15 P.M. Each permanent staff member trained his alternate the next day for approximately one hour, using the appropriate sections of the Handbook. The transition was finally accomplished on Thursday afternoon.

Once the alternate staffing was begun, the suggested plan in the supplement was followed except for one or two steps. By the fifth day of confinement, however, the permanent staff members were apparently sufficiently acquainted with other sheltrees to determine who was capable of assuming the responsibility of

Table 10  
Alternate Shelteree Staff Characteristics  
(ES VII)

Position	Handbook Proposed Specifications	Actual Characteristics	
		Sex and Occupation	Education (Years)
Shelter Manager	Man with proven leadership ability, dependability, and administrative background	Meat Cutter (Male)	12
Assistant Shelter Manager	Man with proven leadership ability, dependability, and administrative background	Student-1 yr. college (Male)	13
Director of Activities	Man with background in physical education or social work	Housewife (Female)	15
Administrative Clerk	Female	Female	11
Director of Radiological Monitoring and Communications	Man with scientific and technical training	Student - Freshman (Male) college	12
Director of Operations	Man with supply-handling experience or training in management	Exterminator Service-Sales (Male)	12
Director of Training	Man with teaching experience	Construction Worker (Male)	12
Director of Supply and Maintenance	Man with supply-handling experience or training in management	Cabinet Designer (Male)	12

(Contd.)

Table 10 (Contd.)

Position	Handbook Proposed Specifications	Actual Characteristics	
		Sex and Occupation	Education (Years)
Section Leader (1)	Man with proven leadership ability, dependability, and administrative background	Student - 10th Grade (Male)	10
(2)		Student-B.S. applied Math (Ga.Tech.) Asst. Grad. Teaching (U.Ga.) (Male)	17
(3)		R.E.A. Transfer Clerk (Male)	12
(4)		Medical Technician (Female)	11
(5)		Seamstress (Female)	11
(6)		Student - 9th Grade (Female)	9
(7)		Truck Driver (Male)	9

the staff positions. Each alternate was then assigned to a position and received instructions from the person whom he was relieving. The new staff members were then given the sections of the Handbook outlining their duties, and assumed command the following day. There was no rotating shift schedule set up for permanent and alternate staffs. The permanent staff had been on duty for five days and there were only two days left for the alternate staff to function. The people chosen to fill alternate staff positions displayed no unwillingness toward assuming responsibility of the positions to which they were assigned.

Although the alternate staff members were not selected according to the plan in the handbook supplement, each member seemed capable of carrying out the duties of his assigned position. They were prepared to perform these duties of the permanent staff using Handbook instructions. They probably were familiar with most of the duties since they had been in the shelter five days prior to being selected. Observers noted that in some instances the alternate staff members displayed initiative and were considered to be successful in performing their duties and following the schedule set up by the permanent staff.

#### G. Conclusions

An observation revealed the necessity for all instruction leaflets to be shortened and clarified.

##### 1. Temporary Phase

The incompetence of the Shelter Manager led to a prolonged temporary phase. Perhaps more than one person could be made Shelter Manager to insure the completion of all tasks.

The proposed method of forming sections collapsed when the leaflets were not passed out as programmed. Temporary phase forms were not filled out correctly because of a lack of detailed instructions. Too much time was used by the Radiological Monitor's referral to two sets of instructions before monitoring commenced.

##### 2. Transition Phase

Overall, this phase was late in starting and took much longer than was expected. The Shelter Manager had difficulty in interpreting the instructions regarding this phase.

##### 3. Permanent Phase

Several shelter forms were not followed or were used incorrectly. Apparently, the rationale for four meals per day was not

sufficiently persuasive. Also, the instructions for the Director of Operations were too lengthy and involved.

The Shelter Log and the Section Leader's Selections form were also misinterpreted. The selections form was never used, since the directors chose their own assistants when needed.

The alternate shelteree staff offered relief to the permanent staff, although not implemented until the sixth day of the study.

#### H. Recommendations

##### 1. Temporary Phase

- a. Investigate a joint assumption of Shelter Manager duties by the first three adults who enter the shelter.
- b. Revise the method by which staff members receive their instructions.
- c. Revise section formation instructions.
- d. Structure the Census Taker's Tally Sheet.
- e. Stress need for completion of Shelteree Information sheets. Give examples for each category on this form.
- f. Simplify the Radiological Monitor's instructions.

##### 2. Transition Phase

- a. Attempt to initiate the transition phase earlier.
- b. Investigate the use of a biographical leadership form for selection of permanent staff members.

##### 3. Permanent Phase

- a. Stress completion of Shelter Map form.
- b. Define exactly material to be entered in the Shelter Log.
- c. Simplify food and water calculations.
- d. Stress sanitation in Commode Monitors' instructions.
- e. Provide a simulated program for Radiological and Communications Monitors.

f. Explain fully the idea of rotation of duties by the permanent and alternate shelteree staffs.

### III. Shelter Shadow Staff Training

To evaluate the Handbook, each shadow staff member was given a copy of the section of the Handbook for the position he was shadowing. Beside the steps of each section were three evaluative scales.

The first scale was a "Yes-No" category for completion evaluation of the instructions. A second scale further evaluated affirmative responses as the first scale. Ratings of 1, bad; 2, poor; 3, fair; 4, average; and 5, good, were made. A time category composed the third scale, to determine the length of time needed for the completion of each step.

Another shadow staff Handbook evaluation procedure was completed at the end of both the temporary and permanent phases. At these times the shadow staff evaluated the size of the shelteree staff, the instructions given for each staff position, the selection of various staff members, the work load of each shelteree staff member, the readability of the instructions in the Handbook, and the amount of cooperation among shelteree staff members.

Data from shadow staff forms and reports proved instrumental in the subsequent revision of the Handbook for ES VIII.

## Chapter 10 - In-Shelter Program

### I. In-Shelter Activity Schedule

Handbook recommendations were not followed in all instances. For example, it was decided that there would be three food and water distributions before the Handbook was read. Apparently some sections of the Handbook were not read at all. Another factor was the shelteree staff. Some of them had little or no experience in supervising, and most had trouble reading and comprehending the instructions. A shorter, more concise listing of jobs to be done might help to get the Handbook read and in the correct sequence.

In the Handbook it was suggested that most activities be carried out by sections. This suggestion was almost achieved. The configuration of the shelter--two floors with four rooms--almost forced some activities to be done in section-like groups. Although an attempt was made to form sections, the pattern that emerged was one of "room groups." With the exception of the shelter-wide training and recreational periods, activities were carried out on a room basis.

The schedule followed in the shelter provided for a large amount of free time (see Table 9). The individual shelterees used this time to engage in various activities--smoking, conversation, card playing, and other games. Other activities such as staff meetings, sweeping the floors, and general clean-up were integrated into each day's schedule as needed. Continual improvising characterized some of the activities and was primarily in the areas not listed on the suggested schedule. For instance, some bulky pieces of luggage and some empty water drums were stored on top of the first floor commode structure. During the latter part of the week, the stairway was designated as a lounge area at night. Ash trays were made from metal lids from the carbohydrate supplement cans.



#### A. Training

The supplement recommends that training sessions consist of both lecture and discussion and be given in section groups. Two training sessions per day are suggested.

Five lectures were given: "Adjusting to Shelter Life," Sunday, June 21; "First Aid," Monday, June 22; "First Aid," Wednesday, June 23; "Radiation," Thursday, June 24; "Decontamination," Friday, June 25. All were held in the large downstairs room, and all except one were given during the morning hours. They lasted from fifteen to twenty minutes. Little discussion followed any presentation.

The DT did not give any lectures himself but recruited others to give them. These shellees were usually unfamiliar with the material they presented. Ideally, the person most familiar with the topic should be selected to give the lecture and lead the discussion. For example, it would have been better for the doctor or nurse to give the lecture on first aid rather than the two teen-age boys who did so.

Since attendance was voluntary, the number attending decreased as the training sessions continued. However, if the SM had stressed the importance of the lectures, the Ss might have had a better attitude towards them. It would have been helpful for the SM, at the first training lecture, to give a summary of what the training was to accomplish along with a brief synopsis of all the lectures in the series. Instead, he confined his role to calling for quiet just prior to the introduction of the lecturer by the DT.

The Ss' most frequent complaints about the lectures were that they were not loud enough and that the room was too big. Had the recommendations of the supplement been followed, these complaints probably would not have occurred.



## B. Exercise

In the shelter, the daily exercise period was held at mid-morning on a group basis by rooms. The kind of exercise varied with the age and sex of the leader. Generally, teen-age males chose exercises that were too strenuous and then conducted them too rapidly. Most exercise periods did not exceed ten minutes. The exercises were primarily the calisthenic type with a few isometrics.

The supplement listed various exercises for the entire group, and for the respective groups of men, women, and children. The suggested exercises were not followed, and none of the homogeneous groups were formed.

A possible explanation for the difference between the actual and the suggested exercise periods was the failure of the SM to emphasize their importance to shelter living.



## C. Religion

The Handbook instructs the DA to have ministers or other clergymen, if they are present, to serve as religious counselors to the shelterees.

The supplement, in emphasizing the importance of the shelter religious program, suggests that some form of religious observance be held every evening in each section. A suggested outline for a Sunday religious service is also included in the supplement.

The shelterees observed Sunday with a non-denominational service conducted by an adult male approximately 50 years old. No extensive preparations were made for the service. It was a shelter-wide activity held in the large room on the first floor. Three young females fainted during the service causing some minor excitement.

Vespers were held each evening about one half-hour prior to lights out. They were conducted on a room basis with different individuals in charge each night. A typical vesper service consisted of reading a selected passage from the Bible and concluding with a short prayer.

Other religious activity consisted of isolated individual Bible reading.

#### D. Nursery

The nursery was a much needed facility in the shelter. Each floor maintained a nursery which was to be held during the training periods. This permitted the parents to attend the lectures as well as freeing them of their parental duties for a time. Some of the older teen-agers, as well as some adults, served as baby-sitters in the nursery.

The supplement suggests that during the first session of the nursery, the children should be instructed on how to use the commode properly. This suggestion was ignored, possibly because of a lack of appreciation of the importance of the instruction.

The nursery only met once a day, although the supplement suggests it be held twice daily. The children had a large amount of free time. Part of this was spent constructively playing with an assortment of toys, books, etc. brought by their parents. Some of the toys were not adapted to shelter life. The children that played with these toys created some disturbances, but no discipline was administered by either parents or their SL.



#### E. Feeding

The Handbook recommends four food and water distributions per day with two additional water distributions. It also gives the proper sanitary procedures for distributing rations by both the fixed-point and moving-point methods.

In the shelter, food and water were distributed three times daily. There were three additional water distributions, two interspersed between the three meals, and the last about one hour prior to lights out. The fixed-point distribution method was employed; each room had one distribution point, except for the larger down-stairs room which had two.



The two major problems concerning food and water distribution activity were sanitation and managerial supervision. Pertaining to sanitation, the crackers and carbohydrate supplement were in the most part handled directly by the shelteree distributing them. In one instance, a shelteree orally started the water siphoning. Proper managerial supervision accompanied by a thorough knowledge of the Handbook suggestions would have either reduced or eliminated the unsanitary methods of distribution that were used. Lack of managerial supervision was very noticeable. No control was exercised over the sheltrees in the food and water distribution lines. The opportunists would go back for "seconds" on water and carbohydrate supplement. A constant inventory of the rations remaining was not kept, although it is suggested by the Handbook.

Either lack of reading or lack of understanding of the Handbook caused the poor supervision of this activity by the SM and DO. After the food and water distribution points were put into operation, the DO exercised little additional supervision. This may have happened because the Handbook fails to emphasize the importance of daily supervision of this activity. Another cause may have been the lack of prior supervisory experience by the DO.

Some solutions used by the sheltrees to make food and water distribution more sanitary were to wear the plastic gloves stocked in the SK IV when dispensing the rations, to wash their hands before handling any food, and to clean up around each distribution point immediately after everybody had received his rations.



There were no aversions to eating three times per day rather than four, as suggested in the Handbook, possibly because of adjuncts brought by shelterees into the shelter. Perhaps more complaints about food and water distribution would have been made through the proper channels and would have effected some results if the management structure had been properly organized.

#### F. Sleeping

The Handbook recommends sleeping by section. Single females and males should be segregated for sleeping. Family groups should be kept together. Aisles are needed between sections so that the Safety Watch and others who have to move around at night will have ease of mobility. To calm the children so that they will sleep, a short quiet period just before bedtime is recommended.

The 10-hour sleeping period began approximately at the 9:00 P.M. lights-out. Lights-on was 7:00 A.M. An hour-long rest period was held each afternoon.

The arrangement for sleeping was somewhat chaotic due to lack of staff supervision. The existing aisles were so poorly defined that movement was restricted. To move about, shelterees had to step over people and equipment. An occasional misstep would cause a small disturbance. The SM disregarded instructions regarding sexual segregation of single people, and the CDR staff specifically requested that he follow the instructions. The SM complied, but he did not continue action to insure that the proposed sleeping arrangement be carried out for the remainder of the study. Three possible reasons why the sexually-segregated sleeping arrangement functioned inefficiently were: (1) lack of staff emphasis, (2) refusal of Ss to move from "their space" with personal supplies unless absolutely forced to do so, and (3) inconvenience of Ss moving with personal supplies to new locations.

The disturbances that most interfered with sleep were talking after lights out, movement to and from the Commode Areas, children crying, and occasional radio playing.

To help alleviate the talking after lights-out, the stairway was designated as a lounge area for smoking and talking. This isolated the noise, thereby aiding sleeping conditions.

One problem which developed was that of allocating space left by defectors. This was rapidly solved by the more aggressive shelterees who spread out and established dominion over the extra space. Management paid little attention to this problem. Any hostilities caused by this method of allocating space were solved by the competing parties. Proper managerial supervision of this problem would have improved both the sleeping and the rest period.



#### G. Recreation

Recreation periods were held in the large room on the first floor. The female shelterees were the initiators and maintained the impetus of these periods. Interest was high for all recreational periods.

Group activities included bingo games (with prizes of candy and small articles), song-fests, a beard contest, and a talent show. Individual and smaller group activities included playing cards and games, reading, and listening to the radio.

The major complaint in this area was lack of recreational supplies. Despite this problem, the Ss, especially the females, were able to improvise. For example, cracker boxes were stacked for use as a stage.

## II. Medical Complaints

As part of their responsibility for the health of shelterees, the physicians and nurses were provided with Medical Record forms on which to keep accurate accounts of complaints registered with them. (See Appendix B for daily records.) Table 11 presents an age and sex breakdown of medical complaints during each eight-hour medical shift of ES VII, and on the basis of this ordering of complaints the following observations may be made:

- A. The largest number of medical complaints (124) was registered on the second day of confinement; and more than one hundred complaints were registered on the fifth and sixth days of confinement, 121 and 116 respectively. (See Figure 5.)
- B. During the week the largest number of medical complaints came from adults 20-39 years of age (29% of the total complaints registered). Children 12 years of age or younger registered 28% of the total medical complaints; teen-agers, 27%; adults 40-54 years of age, 10%; and older adults 55 years of age or older, 6%. A comparison of the percentage of medical complaints by age groups with the percentage of total shelterees in approximately the same age range reveals that a higher percentage of adults 20-39 years of age registered complaints than would be expected on the basis of their proportional representation in the shelter population. Complaints from all other age groups appear to be more directly proportional to the size of the groups.
- C. More than one-half (54%) of the medical complaints registered during the week occurred in the late afternoon or evening. Thirty-four per cent occurred in the morning or early afternoon, and 13% occurred during the night hours.
- D. Of the total medical complaints occurring during ES VII, 59% came from females and 41% from males. More females than males registered medical complaints in all age groups.

As to the nature of the complaints brought to the in-shelter physicians, the three most prevalent were headaches (208), "nerves" (102), and colds, coughs, sore throats, and stuffy noses (97). (See Table 12 for a daily breakdown by sex of the nature of all complaints.)

From Table 12 the following additional insights may be gleaned:

- A. Headache complaints were most prevalent during the first two days of confinement and tended to diminish thereafter.
- B. Complaints of a respiratory nature increased as the length of confinement progressed.

Table 11

Number of Medical Complaints  
 (Based on Number of Shelters Complaining)  
 (ES VII)

Shift	Sat. 6/19			Sun. 6/20			Mon. 6/21			Tues. 6/22		
	M	F	T	M	F	T	M	F	T	M	F	T
Children (12 years and younger)												
11-7	--	--	--	1	4	5	0	0	0	0	0	0
7-3	4	0	4	9	12	21	2	5	7	4	3	7
3-11	4	9	13	10	6	16	6	6	12	7	3	10
Total	8	9	<u>17</u>	20	22	<u>42</u>	8	11	<u>19</u>	11	6	<u>17</u>
Teen-agers (13-19 years)												
11-7	--	--	--	0	1	1	0	1	1	2	2	4
7-3	1	2	3	7	5	12	1	1	2	3	10	13
3-11	3	11	14	4	4	8	9	6	15	12	9	21
Total	4	13	<u>17</u>	11	10	<u>21</u>	10	8	<u>18</u>	17	21	<u>38</u>
Younger Adults (20-39 years)												
11-7	--	--	--	0	4	4	0	2	2	1	3	4
7-3	0	0	0	6	12	18	0	5	5	4	8	12
3-11	6	7	13	5	11	16	3	14	17	5	8	13
Total	6	7	<u>13</u>	11	27	<u>38</u>	3	21	<u>24</u>	10	19	<u>29</u>
Adults (40-54 years)												
11-7	--	--	--	0	0	0	0	1	1	1	2	3
7-3	0	1	1	2	7	9	0	5	5	0	2	2
3-11	3	1	4	3	1	4	1	1	2	2	2	4
Total	3	2	<u>5</u>	5	8	<u>13</u>	1	7	<u>8</u>	3	6	<u>9</u>
Older Adults (55 years and over)												
11-7	--	--	--	0	0	0	1	0	1	0	0	0
7-3	0	0	0	0	0	0	0	2	2	1	1	2
3-11	2	0	2	1	1	2	1	1	2	1	2	3
Total	2	0	<u>2</u>	1	1	<u>2</u>	2	3	<u>5</u>	2	3	<u>5</u>
Total Complaints												
11-7	--	--	--	1	9	10	2	4	6	4	6	10
7-3	5	3	8	27	38	65	3	19	22	13	24	37
3-11	18	28	46	24	25	49	23	29	52	27	26	53
Total <sup>a</sup>	23	31	<u>54</u>	52	72	<u>124</u>	28	52	<u>80</u>	44	56	<u>100</u>

(Contd.)

Table 11 (Contd.)

Shift	Wed. 6/23			Thurs. 6/24			Fri. 6/25			Sat. 6/26		
	M	F	T	M	F	T	M	F	T	M	F	T
Children (12 years and younger)												
11-7	0	2	2	2	1	3	0	2	2	3	4	7
7-3	1	14	15	8	9	17	3	3	6	1	0	1
3-11	7	8	15	8	11	19	4	5	9	--	--	--
Total	8	24	<u>32</u>	18	21	<u>39</u>	7	10	<u>17</u>	4	4	<u>8</u>
Teen-agers (13-19 years)												
11-7	4	1	5	3	2	5	2	2	4	3	2	5
7-3	3	2	5	1	6	7	2	5	7	0	1	1
3-11	14	8	22	6	8	14	5	4	9	--	--	--
Total	21	11	<u>32</u>	10	16	<u>26</u>	9	11	<u>20</u>	3	3	<u>6</u>
Younger Adults (20-39 years)												
11-7	2	1	3	3	5	8	1	4	5	2	2	4
7-3	5	7	12	1	6	7	2	5	7	1	1	2
3-11	7	10	17	9	6	15	1	9	10	--	--	--
Total	14	18	<u>32</u>	13	17	<u>30</u>	4	18	<u>22</u>	3	3	<u>6</u>
Adults (40-54 years)												
11-7	0	1	1	2	0	2	0	2	2	2	1	3
7-3	0	0	0	1	0	1	2	1	3	0	0	0
3-11	4	6	10	3	5	8	0	3	3	--	--	--
Total	4	7	<u>11</u>	6	5	<u>11</u>	2	6	<u>8</u>	2	1	<u>3</u>
Older Adults (55 years and over)												
11-7	1	0	1	0	0	0	1	0	1	0	0	0
7-3	2	1	3	1	1	2	1	3	4	0	0	0
3-11	1	3	4	2	3	5	0	3	3	--	--	--
Total	4	4	<u>8</u>	3	4	<u>7</u>	2	6	<u>8</u>	0	0	<u>0</u>
Total Complaints												
11-7	7	5	12	10	8	18	4	10	14	10	7	17
7-3	12	26	38	12	22	34	10	17	27	2	4	6
3-11	33	38	71	30	34	64	10	24	34	--	--	--
Total <sup>a</sup>	52	69	<u>121</u>	52	64	<u>116</u>	24	51	<u>75</u>	12	11	<u>23</u>

<sup>a</sup>Any discrepancy between total complaints across age categories and the summary of total complaints is due to some relatively few instances where persons were found to be unclassifiable by age from the shelter medical records. In such cases either an erroneous name was listed or one person, e.g., a parent, saw the physician and received medication for one or more other persons.

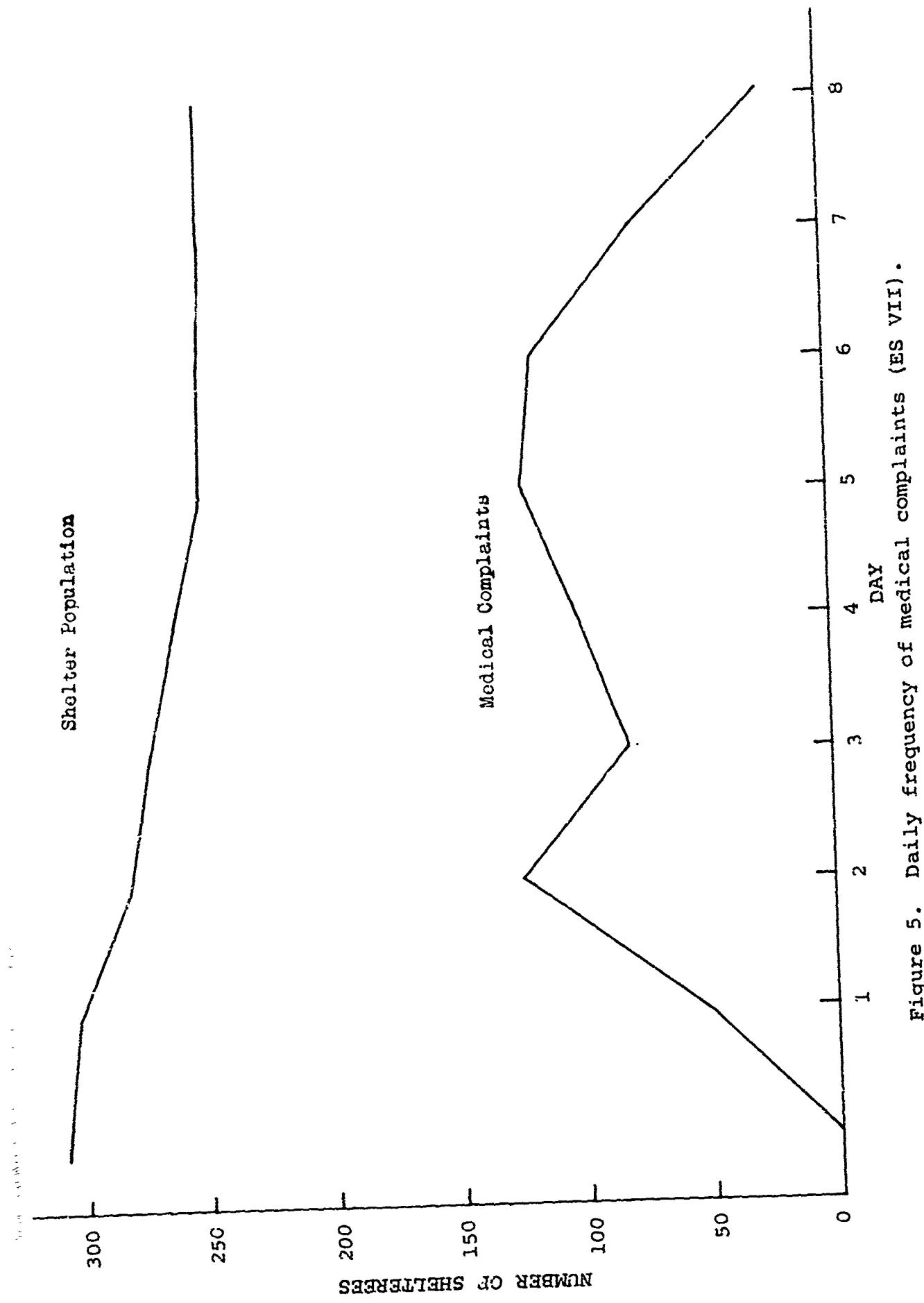


Figure 5. Daily frequency of medical complaints (ES VII).

Table 12

Nature of Medical Complaints  
 (Based on Number of Shelters Complaining)  
 (ES VII)

Complaint	Saturday 6/19			Sunday 6/20			Monday 6/21			Tuesday 6/22		
	M	F	T	M	F	T	M	F	T	M	F	T
Headaches	20	21	<u>41</u>	19	28	<u>47</u>	11	9	<u>20</u>	12	12	<u>24</u>
Cuts and abrasions	0	2	<u>2</u>	2	5	<u>7</u>	--	7	<u>7</u>	2	3	<u>5</u>
Pimples, boils, infections	--	--	--	1	3	<u>4</u>	--	1	<u>1</u>	3	3	<u>6</u>
Nervous	0	3	<u>3</u>	5	7	<u>12</u>	5	11	<u>16</u>	9	9	<u>18</u>
Constipation	--	--	--	--	--	--	3	2	<u>5</u>	5	--	<u>5</u>
Insomnia	--	--	--	--	--	--	6	4	<u>10</u>	2	2	<u>4</u>
Allergy, rash	1	0	<u>1</u>	2	2	<u>4</u>	--	--	--	1	--	<u>1</u>
Cold, cough, sore throat, stuffy nose	0	1	<u>1</u>	2	3	<u>5</u>	1	1	<u>2</u>	6	3	<u>9</u>
Upset stomach, nausea, vomiting, cramps	--	2	<u>2</u>	5	6	<u>11</u>	1	5	<u>6</u>	1	9	<u>10</u>
Diarrhea	--	--	--	--	--	--	--	--	1	<u>1</u>	--	<u>2</u>
Ear and toothache	--	--	--	4	--	<u>4</u>	1	1	<u>2</u>	3	3	<u>6</u>
General aches, backache	--	--	--	--	1	<u>1</u>	--	4	<u>4</u>	1	3	<u>4</u>
Miscellaneous <sup>a</sup>	1	2	<u>3</u>	4	5	<u>9</u>	--	3	<u>3</u>	1	1	<u>2</u>

(Contd.)

Table 12 (Contd.)

Complaint	Wednesday 6/23			Thursday 6/24			Friday 6/25			Saturday 6/26		
	M	F	T	M	F	T	M	F	T	M	F	T
Headaches	11	13	<u>24</u>	17	16	<u>33</u>	7	7	<u>14</u>	3	2	<u>5</u>
Cuts and abrasions	3	6	<u>9</u>	--	9	<u>9</u>	1	3	<u>4</u>	--	1	<u>1</u>
Pimples, boils, infections	1	6	<u>7</u>	--	4	<u>4</u>	--	2	<u>2</u>	--	--	--
Nervous	14	14	<u>28</u>	5	10	<u>15</u>	5	5	<u>10</u>	--	--	--
Constipation	1	2	<u>3</u>	5	2	<u>7</u>	--	2	<u>2</u>	1	--	<u>1</u>
Insomnia	5	1	<u>6</u>	6	5	<u>11</u>	2	6	<u>8</u>	3	--	<u>3</u>
Allergy, rash	--	--	--	--	--	--	--	--	--	--	--	--
Cold, cough, sore throat, stuffy nose	9	9	<u>18</u>	16	13	<u>29</u>	6	16	<u>22</u>	5	6	<u>11</u>
Upset stomach, nausea, vomiting, cramps	4	7	<u>11</u>	1	4	<u>5</u>	--	5	<u>5</u>	1	2	<u>3</u>
Diarrhea	--	2	<u>2</u>	1	1	<u>2</u>	2	2	<u>4</u>	--	3	<u>3</u>
Ear and toothache	--	1	<u>1</u>	--	3	<u>3</u>	--	--	--	--	--	--
General aches, backache	--	1	<u>1</u>	1	0	<u>1</u>	--	--	--	--	--	--
Miscellaneous <sup>a</sup>	6	3	<u>9</u>	2	0	<u>2</u>	3	1	<u>4</u>	0	1	<u>1</u>

<sup>a</sup>For example: nose bleeds, splinters, sore mouth, fainting, burning eyes.

- C. Complaints related to nervous conditions increased from day to day through the fifth day (Wednesday) and diminished in frequency toward the end of the confinement period.
- D. Complaints of diarrhea and constipation were minimal, although they increased somewhat over time. Constipation complaints were more frequent than those pertaining to diarrhea. However, upset stomachs, nausea, vomiting, and cramps comprised more complaints than either constipation or diarrhea per se, but it is not possible to determine the exact nature or cause of these complaints on the basis of medical records.

### III. Post-Shelter Medical Reports

The following reports are quoted almost in entirety from the post-shelter medical reports submitted after study completion.

#### A. 11:00 P.M. - 7:00 A.M. Shift

##### Physician:

The large number of headaches reported during the day of entrance into the shelter was probably due to the initial period of hunger and to the emotional tension of getting organized into the new shelter environment. Headache and nausea continued to be a minor problem through the remainder of the confinement.

The largest medical problem was an outbreak of upper respiratory infections and tonsillitis, particularly among the younger children. This was more widespread on the lower floor of the shelter. The cause was probably both viral and streptococcal in etiology. The excessive heat followed by drafty ventilation in close quarters was undoubtedly a contributing factor. Insomnia increased as the study progressed. Several lacerations occurred but there was no problem of infection. There were several cases of dysmenorrhea but they present no particular problem. There were a few cases of gastrointestinal complaints--indigestion, constipation, and diarrhea--but diarrhea was never a major problem. The medical supplies in the kit were adequate. Phenobarbital and aspirin were the most widely used medicines from the kit. Penicillin became one of the most important items as the respiratory infections increased. Penicillin should have been used more at the onset of symptoms of upper respiratory infections. The only item in the kit for which little use was found was petrolatum.

Several drugs were brought in by the medical staff. Robitussin, Benylin expectorant and Codinyl cough syrup were brought in for the treatment of cough. Stelazine and Compazine capsules were brought in for the treatment of anxiety and nausea, Elixir of phenobarbital

and Elixir of Benadryl were brought in for the children who were too small to take phenobarbital tablets, Maalox, Gelusil and Donnatal were used in the treatment of indigestion and hyperacidity. These drugs were limited in supply, but they proved to be most beneficial.

Medical supplies for future shelters should include a good cough medication, preferably one containing codeine, for the treatment of respiratory infections. An antiemetic such as Phenergan or Compazine would be of some help. An antacid and/or anticholinergic medication without the rebound phenomenon of sodium bicarbonate would be of help in combating gastric hyperacidity and abdominal discomfort. Simple bandaids would help a great deal.

Since it was difficult to maintain accurate records, due to the medical staff being on a rotation shift, it would be advisable for each medical kit to contain a looseleaf notebook so that a separate record could be begun on each shelteree that presented himself with a complaint. This would be of particular benefit in following up on patients on continued medications, such as aspirin for fever, antibiotics for infection and cough medication.

Registered Nurse:

The medicine in the kit seemed to be adequate but it could stand certain additions. Cough syrup and stimulants such as epinephrine to be used for asthmatic or heart conditions might be necessary. An antacid such as Maalox might be used for indigestion and other stomach disorders as well as using bicarbonate of soda. Fainting could call for ammonia. Nausea could be treated with Dramamine. Band aids could be added. A cleansing agent, other than alcohol for wounds and urticaria would help, for example, Hex-A-Germ or Zephiran. Airways could be added as well as an increased number of thermometers.

A different method should be devised for dispensing the water because the present method can easily cause the water to be contaminated. There should be some way for each shelteree to cleanse his hands after using the toilet. Lack of this could cause diseases; perhaps alcohol could be used for this purpose.

B. 7:00 A.M. - 3:00 P.M. Shift

Physician:

Concerning medicine supply, cough medicine should be added to the kit. The cough medicine should contain an antihistaminic drug. Adhesive tape should be included since the type of injuries that occur in the shelter can more easily be fixed with tape than with gauze.

The diet is defective in protein.

The water supply should be dispensed in more sanitary fashion, perhaps by having the rubber hose come out of the bottom of the water drum.

Registered Nurse:

The general medical complaints included: headache, nausea, insomnia, cuts, scratches, indigestion, nervousness, nasal congestion, sore throats, coughing, rare complaints.

The present medical kit was adequate for most complaints. The medical teams coming into the shelter brought additional supplies such as bandaids, adhesive tape, cough medicine, and antacid medicine. The kit has an over-supply of cascara, cotton, and cotton-tipped applicators.

In future kits certain other drugs and supplies might be added: Merthiolate and cough syrup, an antihistamine kit should provide an upright plastic container for soaking soiled thermometers and a container for water for cleaning wounds, and folded paper cups for dispensing medications and water. Medical area should have its own water supply. Kit should include tape and bandaids and smaller tipped forceps. Medical notebook should provide individual medical follow-up sheets.

Certain items in the kit have other uses besides medical. Tongue blades can be used for stirring and eating. The surgical soap can be used by food and water handlers. The muslin bandage can be used as a blindfold.

The instructions for allied medical workers should include how to use iodine water purification tablets. Each patient treated with any medication, including aspirin, Penicillin, Sulfa drug, should be asked about any known allergy to any medicine.

There should be less draft within the shelter. A plastic coated paper cup would be more durable than either paper or styrofoam. For sanitary reasons, the cups must be cared for. Caution for care of cups and their cleanliness should be in the initial instructions of section leaders.

Shoes should be worn at all times by adults and children.

More instructions concerning the treatment of burns, fractures, and nausea should be given. If possible, a survival kit list might be given to all interested persons and include the items mentioned above.

C. 3:00 P.M. - 11:00 P.M. Shift

Physician:

Medical kit is adequate for shelter use even by a non-medical person. Certain additions, however, could add to the effectiveness of medical treatment in the shelter. An antipyretic in liquid form, cough syrup and a barbituric elixir should be available for the treatment of children. For adult use, antiemetic, antacid, and anti-spasmodic medicines would prove helpful. The types of bandages provided in the kit were not as useful as smaller bandages, such as thin rolls of tape or band-aids would have been. Most injuries (cuts and abrasions) sustained in the test were small and required only small bandages. For fractures the new type of plastic air-bag (easy to store and handle) splints would be better than improvised cardboard splints since the patient in a shelter would not have to be moved to a hospital. Cardboard splints would be inadequate for long confinement in the shelter if compared to the easy access to pressure areas and the ease of circulation that are facilitated by the plastic-bag splints.

Brooms and cleaning materials should be provided in the shelter to keep dust to a minimum, since this dust was the main cause of throat and eye irritations. During the last days of the test, the dust was also the cause of skin infections.

The bright lights for the cameras caused many cases of headaches as did the tension. Due to the artificial nature of the study, a proper evaluation of the future use of tranquilizers cannot be given.

To aid cleanliness, it would be helpful to include enough water for each shelteree to wash his hands during the test.

Registered Nurse:

Reported a general enthusiasm for the adequacy of Medical Kit C, especially in light of shelf-life requirements for storage. Did suggest, however, that tablets such as Phenergan be included for nausea and that bicarbonate of soda be supplied in tablet form. Plastic bandaids would also have proven quite helpful, since bandaging materials supplied were not practical for common cuts and other skin problems.

Of the other supplies, the drinking cups should merit more attention. The ones utilized in ES VII were not durable for the time needed.

Water-dispensing methods were not sanitary in some instances, and this area of shelter living needs strategic attention. Careful following of routines for purifying water and maintaining sanitation

is a necessity. Also, the use of food-ration can lids for ash trays is a danger because of the sharp edges and the indiscriminate manner in which they were left lying around the shelter. These should be carefully controlled.

Of the medical complaints encountered, comments were offered only on the etiology of headache complaints. Most headaches were caused by the bright lights used in filming and the poor though not dangerous lack in proper ventilation and cooling.

#### IV. Shelteree Reactions

##### A. In-Shelter Events

The following is a summary of Observer I and II reports.

Saturday, June 19:

The first Ss entered the shelter at 11:55 A.M. By 12:45 P.M. all Ss had entered and the outside doors to the shelter were locked.

The first male who entered the shelter picked up the Shelter Handbook and became TSM. After some delay, the TSM began counting off people inside and gave instruction leaflets to others who became temporary staff members. After further delay (see discussion of temporary phase), the temporary staff members began performing their tasks.

During the first three hours following entrance the Ss were busy selecting a location for themselves, reading, and playing games. The second floor seemed to attract a disproportionate number of women and children.

By 3:00 P.M. the permanent staff were in the process of being selected and receiving instructions. Section Leaders began locating their sections. At 3:30 P.M., after a brief talk from the SM, Ss began lining up for food and water, the first for many since before 9:00 A.M. Distribution was completed within an hour.

Evening:

Early evening activities involved Ss settling down within rooms, further organizational activity by the staff, and the establishment of a Medical Area and food and water distribution areas.

There was group singing in the downstairs area, followed by the second distribution of food and water at 7:30 P.M. Shelterees then completed their diaries, and lights were out at 10:15 P.M. The shelteree staff did not initiate segregated sleeping arrangements for single males and females until told to do so by the CDR staff.

Sunday, June 20, Morning:

Shelters were restless the first night in the shelter. They used the Commode Area sporadically throughout the night.

Lights were on at 7:00 A.M. Early morning activities included a food and water distribution period, a clean-up period (poorly organized), and an exercise period.

Five Ss conducted a thirty-minute religious exercise beginning at 10:10 A.M. Following the service a nursery was set up in a room downstairs.

Afternoon:

Food and water were distributed twice during the afternoon (12:20 P.M. and 5:20 P.M.), though not very efficiently. Shelters seemed to accept the survival rations well. Many Ss supplemented rations with food adjuncts brought with them from the outside.

At 1:35 P.M. lights were turned out for a thirty-five minute rest period. Several defected during this time (see Defections).

At 3:00 P.M. Ss attended a lecture entitled "Adjusting to Shelter Life"; they were very attentive.

Loud, noisy children and lengthy commode lines, especially in the female Commode Area, later began to be sources of irritability.

Evening:

Following a clean-up period, a group sing was held for Ss in the large downstairs room. Shelters participated well.

Lights were out at 9:00 P.M.

Monday, June 21, Morning:

Shelters were less restless and appeared to get more sleep than during the first night.

Lights were on at 7:00 A.M. Morning activities included food and water distribution, clean-up, and exercise. Later morning activities included a lecture on first aid (11:20 A.M.), general shelter instructions from the SM, and the setting up of a nursery on the second floor.

The shelter became quite cluttered as Ss used every space available for storage of personal items, none of which had been excluded from the shelter.

**Afternoon:**

Food and water were again distributed shortly after noon and at 5:30 P.M. Shelters occupied themselves with such things as cards, checkers, reading, conversation, etc. The children were noisier and more active.

Shelters occupied themselves with such things as cards, checkers, reading, conversation, etc. The children were noisier and more active.

**Evening:**

Shelters played bingo for more than an hour. Following water distribution, they completed their diaries.

Lights were out at 9:10 P.M.

**Tuesday, June 22, Morning:**

Lights were on at 8:00 A.M. The morning activities were routine except for pumping out the commodes (a USAERDL test procedure). This task necessitated moving the Medical Area temporarily.

**Afternoon:**

A rest period followed food and water distribution. There were several defections (see Defections). It was noted that poor records were being kept of food and water consumption.

Shelters were noisy and active; several practiced for the evening talent show.

There were no training lectures today.

**Evening:**

At 6:35 P.M. shelters attended a fifty-minute talent show. Water distribution, completion of diaries, and vesper services ended the evening activities. Lights were out at 9:10 P.M.

**Wednesday, June 23, Morning:**

Lights were on at 8:00 A.M. The routine morning activities followed. As water distribution control continued to be a problem, the SM announced stricter water-control measures to insure that Ss not be allowed to receive more than their allotment. Since most cups were no longer usable, Ss made cups from paper and used empty fruit juice cans.

A training lecture on first aid was given at 11:20 A.M.

Staff meetings were held at 9:15 A.M. and at noon to formulate plans for an alternate staff organization.

Afternoon:

The alternate staff had been selected by 4:45 P.M. and were receiving instructions from the permanent staff.

Evening:

A second bingo session was held following the food and water distribution. Fewer Ss participated, but those who did were quite enthusiastic. Afterwards, the SM introduced the alternate staff, who were to assume command the following day. A vesper service preceded lights out at 9:50 P.M.

Thursday, June 24, Morning:

Lights were on at 8:00 A.M. Morning activities included food and water distribution, clean-up, exercise, and a training lecture on radiation (11:30 A.M.). At 11:45 A.M. the alternate SM asked Ss to express their appreciation for the permanent staff, a gesture met with enthusiasm.

Afternoon:

Shelterees were looking quite dirty and bedraggled. More irritability among family groups was noted.

Evening:

A second talent show-group sing was held. Shelterees participated well. Afterwards, Ss completed diaries and had vespers. Lights were out at 9:00 P.M.

Friday, June 25, Morning:

Lights were on at 8:05 A.M. Immediately Ss were louder and more active than on previous days. This was true throughout this last full day in the shelter. A lecture on decontamination was given at 11:30 A.M.

Afternoon:

The afternoon activities were routine. Interactions between parents and children continued to appear strained. Activity and noise levels continued to be high in obvious anticipation of leaving the shelter on Saturday. Shelterees completed a Post-Shelter Questionnaire.

**Evening:**

A final talent show-group sing was held. A prize was presented for the "best beard" in the shelter. Shelters were in obviously high, jovial spirits. They were given instructions on exiting the shelter and were allowed to vote on the times for "lights out" and "lights on."

Following completion of diaries and a vespel service, lights were out at 9:10 P.M.

**Saturday, June 26, Morning:**

Shelters had a good night's sleep. When lights came on at 6:50 A.M., Ss gave a cheer. Shelters inventoried shelter supplies and packed personal items in preparation for leaving.

At 8:37 A.M. the Project Director addressed the Ss. Shelter exit began at 9:05 A.M. and ended at 9:38 A.M.

**B. Diaries**

**Differences between Structured and Unstructured Diaries:**

From the unstructured diaries in previous studies it was learned the topics on which Ss are likely to comment. On the basis of these observations, a structured diary was designed in which Ss could indicate how they felt about various topics by checking the appropriate phrase (e.g., "very satisfactory," "terrible," "I do not know.") This type diary is more objective and easier to score than the unstructured diary.

Certain differences between the two diary types should be noted: (1) In the structured diaries there was only one category for each item. For example, whereas in this diary type Ss could comment on "food" but once, in the unstructured diaries Ss frequently commented not only on the food in general, but also on the specific items (crackers, carbohydrate supplement). Thus a shelteree might have several scorable items per topic in his unstructured diary to the one in his structured diary. (2) There were no categories for "space" or "organization" on the structured diaries. However, on the unstructured diaries these two items received a higher percentage of negative comments than any other topic. (3) In the unstructured diaries Ss' comments were either positive or negative while in the structured diaries their comments could be either positive, negative, or "I don't know."

For these reasons it is not realistic to compare the total positive or negative comments on the structured diaries with those on the unstructured diaries. Only individual items can be compared.

## 1. Shelter Diary (Unstructured Diary)

The unstructured diaries were given to the shelterees on four days: June 19, June 21, June 23, and June 25. Everyone, including children, was asked to fill out the diaries. Diaries were grouped according to age and sex. Age groups used were: 1-7; 8-16; 17-23; 24-30; 31-40; 41-50; 51-70. From a total of 886 diaries there were 1,993 comments scored. (See Appendix C for scoring criteria.)

The following tables summarize the data from these age groups. Table 13 shows the daily percentages of all the positive and negative comments by both males and females. The Grand Total column depicts the total number of positive and negative comments made over the entire week (e.g., out of a total of 1993 scorable comments, 700 or 35.1% were positive), while the daily figures indicate what percentage of the total positive and negative comments were made on any one day (e.g., 26.9% of 700 positive comments were made on Saturday). Figure 6 is a visual presentation of the percentages of total positive and negative comments for each day. Table 14 shows the percentages and frequencies of positive comments made by males and females. The total positive comments are rank-ordered on the table. Table 15 is a similar table of negative comments. Note that the total scorable comments for each group differs. For a summary of the data from the diaries according to age group see Appendix C (Tables C-1 to C-4). Only age groups with an average of 10 or more diaries per day are included in these tables. Categories receiving 10% (where 10% represents at least 2 scores) or more of the scores are listed. Percentages are given to the nearest one per cent.

### Summary of Unstructured Diaries

There was a 2:1 ratio of negative to positive comments in the diaries. However, this ratio is somewhat misleading. Since the shelterees specified what they disliked but tended to make very general positive statements, the positive scores are much lower than the negative ones. For example, whereas 30.7% of the total positive scores were "Generally Positive," only 3.1% of the total negative scores were "Generally Negative" (see scoring criteria, Appendix C).

#### a. Space

Of all negative comments, 10.9% were complaints about lack of space. Both males and females found lack of space a major discomfort factor. Although most of the Ss' complaints were of a general nature, some indicated that lack of sleeping space was the major problem.

Table 13

Unstructured Diaries--Daily Percentages of Total  
 Positive and Total Negative Comments  
 (ES VII)

Day	Total		Male		Female		Grand Total	
	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.
Saturday, 6/19	26.9	31.9	26.7	30.9	26.9	32.6		
Monday, 6/21	27.9	26.1	27.1	24.7	28.2	27.0		
Wednesday, 6/23	23.0	25.0	25.3	26.0	21.9	24.2		
Friday, 6/25	22.3	17.0	20.9	18.3	22.9	16.1		
					35.1	64.9		

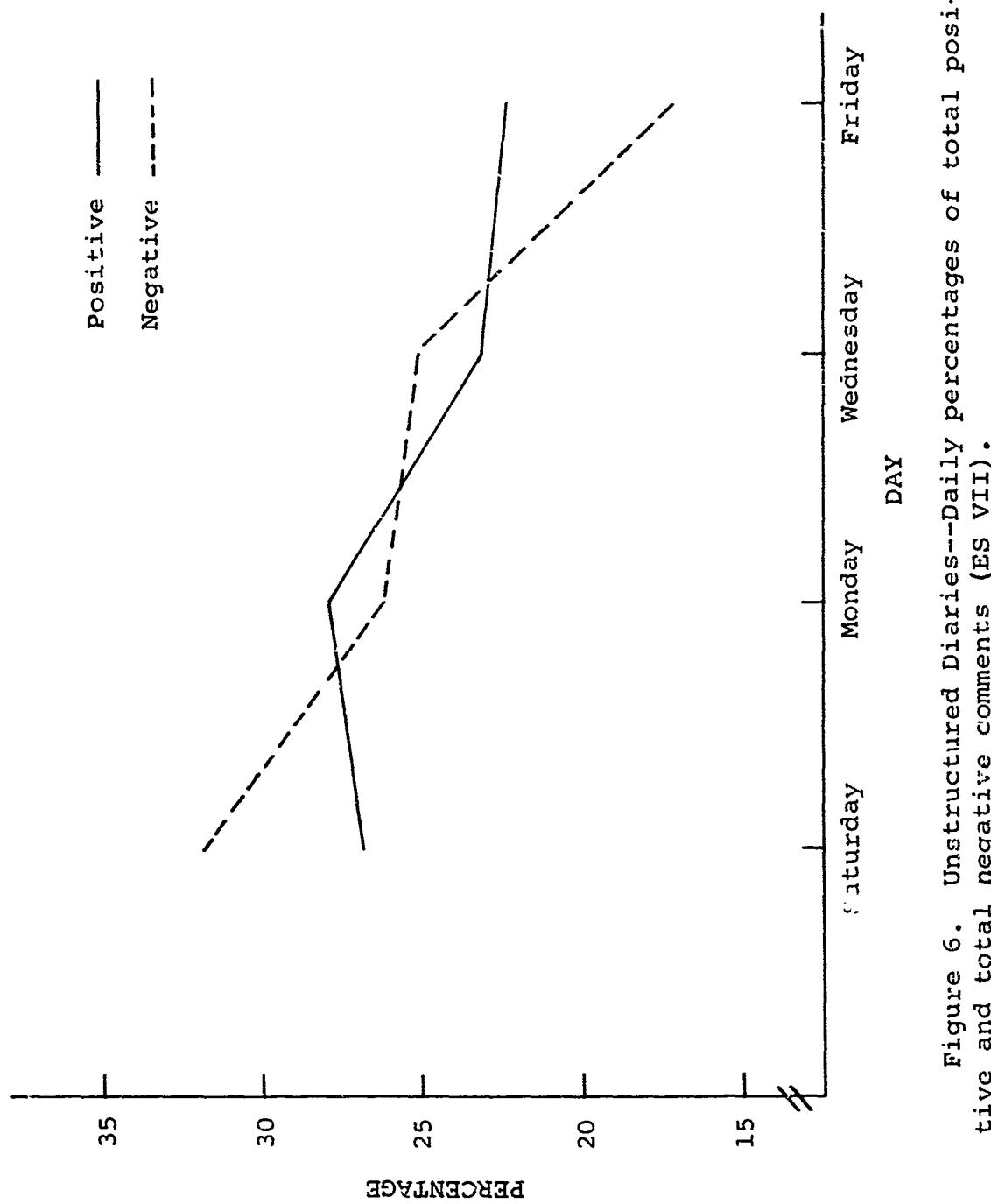


Figure 6. Unstructured Diaries--Daily percentages of total positive and total negative comments (ES VII).

Table 14

Positive Unstructured Diary Comments for  
Male and Female Shelterees  
(ES VII)

Comments	Male		Female		Total	
	Freq.	% <sup>c</sup>	Freq.	%	Freq.	%
Generally positive <sup>a</sup>	90	40.0	125	26.3	215	30.7
Other people	22	9.8	76	16.0	98	14.0
Food	13	5.8	30	6.3	43	6.1
Things better	12	5.3	29	6.1	41	5.8
Sleeping	13	1.9	19	2.7	32	4.6
Carbohydrate supplement	12	5.3	19	4.0	31	4.4
Feelings <sup>b</sup>	11	4.9	18	3.8	29	4.1
Recreation	9	4.0	19	4.0	28	4.0
Amount of food	--	--	23	4.8	27	3.8
Cooperation	--	--	20	4.2	23	3.3
Staff	7	3.1	10	2.1	17	2.4
Crackers	6	2.7	10	2.1	16	2.3
Time	7	3.1	--	--	16	2.3
Water	6	2.7	10	2.1	16	2.3
Comfortable temperature	--	--	10	2.1	14	2.0
	Total scorable comments=225		Total scorable comments=475		Total scorable comments=700	

<sup>a</sup>Includes such statements as "I like being here."

<sup>b</sup>Includes such statements as "I am well."

<sup>c</sup>Only comments with a percentage of 2 or above are included.

Table 15  
 Negative Unstructured Diary Comments  
 for Male and Female Shelters  
 (ES VII)

Comments	Male		Female		Total	
	Freq.	% <sup>c</sup>	Freq.	%	Freq.	%
Space	58	10.9	83	10.9	141	10.9
Food	62	11.7	56	7.3	118	9.1
Crackers	42	7.9	73	9.6	115	8.9
Water	52	9.8	47	6.2	99	7.6
Sleeping	39	3.0	44	3.4	83	6.4
Noise	24	4.5	44	5.8	68	5.2
Toilet	11	2.1	46	6.0	57	4.4
Children	21	4.0	30	3.9	51	3.9
Temperature too hot	14	2.6	35	4.6	49	3.8
Commode odor	17	3.2	30	3.9	47	3.6
Sanitation	20	3.8	23	3.0	43	3.3
Generally negative <sup>a</sup>	19	3.6	24	3.1	43	3.3
Amount of water	19	3.6	20	2.6	39	3.0
Cups	14	2.6	24	3.1	38	2.9
Feelings <sup>b</sup>	--	--	27	3.5	37	2.9
Amount of food	20	3.8	--	--	31	2.4
Organization	13	2.4	16	2.1	29	2.2
Sleeping	16	3.0	--	--	23	--
Tired	11	2.1	--	--	--	--
Pre-entry instructions	--	--	20	2.6	--	--
Lack of bathing facilities	--	--	17	2.2	--	--
Time	--	--	16	2.1	22	--
Total scorable comments=530	Total scorable comments=763	Total scorable comments=1293				

<sup>a</sup>Includes such statements as "I don't like it; I'm going home."

<sup>b</sup>Includes such statements as "I am nauseated today."

<sup>c</sup>Only comments with a percentage of 2 or above are included.



#### b. Food and Water

Approximately one-third (31.7%) of all negative and one-fifth (19.7%) of all positive comments by the sheltenees were about the stocked food and water. Both males and females had about the same percentage of positive comments, but the males had a slightly higher percentage of negative comments (about 10%). Most of the positive comments were about the carbohydrate supplement (4.4%) or about the food in general (6.1%). Most of the negative comments were about the crackers, the water, or about the food in general. The females complained less about the amount of food and water than did the males. As the study progressed, there were more negative comments about the food and water and fewer positive ones.

#### c. Sleeping

Comments about sleeping proved the most difficult to interpret on the unstructured diaries. Comments like "The sleeping arrangements in here are atrocious" can be readily scored negative for "Sleeping," but comments like "I didn't sleep well last night" are open to several interpretations. Comments such as "I couldn't sleep because it was too crowded" were scored negative for "Sleeping" and for "Space," while comments such as "I didn't sleep well last night because people kept stepping on me" were scored negative for "Sleep" and for "Other People." To add further to the confusion, sheltenees frequently made statements like "The floor is too hard," "We should have been told to bring sleeping equipment," and "The bedding is uncomfortable." There is no way of knowing whether or not the sheltenees were making these statements in reference to sleeping. The three statements mentioned above were scored negative for "Floor," "Pre-Shelter Instructions," and "Supplies Brought In," respectively.

Therefore, it is almost impossible to get a meaningful rank order of "Sleeping" from the diaries in the way items like "Food," "Noise," etc., can be ranked. On all days the males had a slightly higher percentage of negative comments about sleeping than the females, but with all the qualifications pertinent to the category, this may be artifactual.

d. Activities

In order to gain some indication of how the shelterees felt about the activities and organization in the shelter, the following categories were grouped: "Organization," "Activities," "Not Enough Activities," "Recreation," "Exercise," "Vespers," and "Lectures" (see scoring criteria, Appendix C). The percentages of positive and negative comments for males and females were determined for each day. For both males and females the percentage of total positive comments tended to increase and the percentage of total negative comments to decrease toward the end of the study. The females had a larger percentage of positive comments and a smaller percentage of negative comments than the males.

e. People

Comments pertinent to other shelterees were scored in five categories: "Other People," "Sharing," "Cooperation," "Staff," and "Children." (See scoring criteria, Appendix C.) Most of the positive comments were scored "Other People," most of the negative comments "Children." By collapsing these categories into one, it was found that both males and females had a higher percentage of positive comments than negative ones. Positive comments out-numbered negative ones from a ratio of 2:1 to a ratio of 13:1 on the various days. The greater percentage of positive comments was found in the female diaries; the greater percentage of negative comments, in the male diaries.

f. Morale

In order to find some indication of morale, the percentages of daily comments in the following categories were determined: "Generally Positive-Generally Negative," "Things Better-Things Worse," "Boredom," "Feelings," and "Total Positives-Total Negatives." (See scoring criteria, Appendix C.) The percentage of total positive comments increased as the study progressed. For example, it was found that approximately 10% more of the shelterees' total comments on the last day were positive as compared with the first day.

Midway through the study there were comments that "Things were getting better" (13%, June 21; 7%, June 23) but not a single negative comment that "Things were getting worse." Likewise, a higher percentage of comments was scored positive for "Feelings" and a lower percentage scored negative on diaries from June 21 and June 23 than on diaries from June 19 and June 25.

## 2. Diary Questionnaire (Structured Diary)

A structured Diary Questionnaire was completed by the shelterees on the evenings of June 20, 22, and 24. A total of 661 diaries was completed (305 male, 356 female).

Specific questions were asked the shelterees, and for purposes of this discussion choices for each question were designated as follows: 1--very positive, 2--positive, 3--undecided ("I do not know"), 4--negative, and 5--very negative. Table 16 and Figure 7 present the mean per cent of males and females responding to choices 1 through 5 for the three days that the Diary Questionnaire was administered.

The results for June 20 yielded a mean per cent of 12.9 for very positive responses for males, while results for females yielded a per cent of 11.4. For the positive category the male mean per cent was 51.3, with the female responses reaching 53.5%. The total mean per cent for choices 1 and 2 for males and females was 64.2 and 64.9, respectively. This relatively high percentage of positive responses indicates that the majority of shelterees were satisfied both with the environmental aspects of shelter living and with interpersonal relations.

The categories negative and very negative for June 20 yielded a total mean per cent of 25.4 for males and 26.4 for females, indicating a much smaller percentage of shelterees who were actually unhappy with the shelter situation as a whole.

The results for June 20 for the undecided category yielded a mean per cent of 10.4 for males and 8.7 for females, indicating a relatively low degree of undecidedness.

As Table 16 shows, the results for June 22 and June 24 for the five categories are similar to June 20. Overall positive (very positive and positive combined) ratings account for over 60% of the total responses. There was a tendency for overall positive responses to increase across confinement days, while a resultant drop in overall negative (very negative and negative combined) responses was noted. In

Table 16

Structured Diaries--Mean Positive and  
Negative Choice Percentages  
(ES VII)

Day	Total Male Choices					Total Female Choices				
	Very Positive		Un-		Very Negative	Very Positive		Positive decided		Very Negative
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
June 20	12.9	51.3	10.4	14.6	10.8	11.4	53.5	8.7	15.9	10.5
June 22	15.0	57.1	8.0	12.0	8.0	16.4	57.9	5.9	11.5	8.3
June 24	18.7	57.9	5.9	9.7	7.9	22.5	55.4	4.4	9.5	8.2

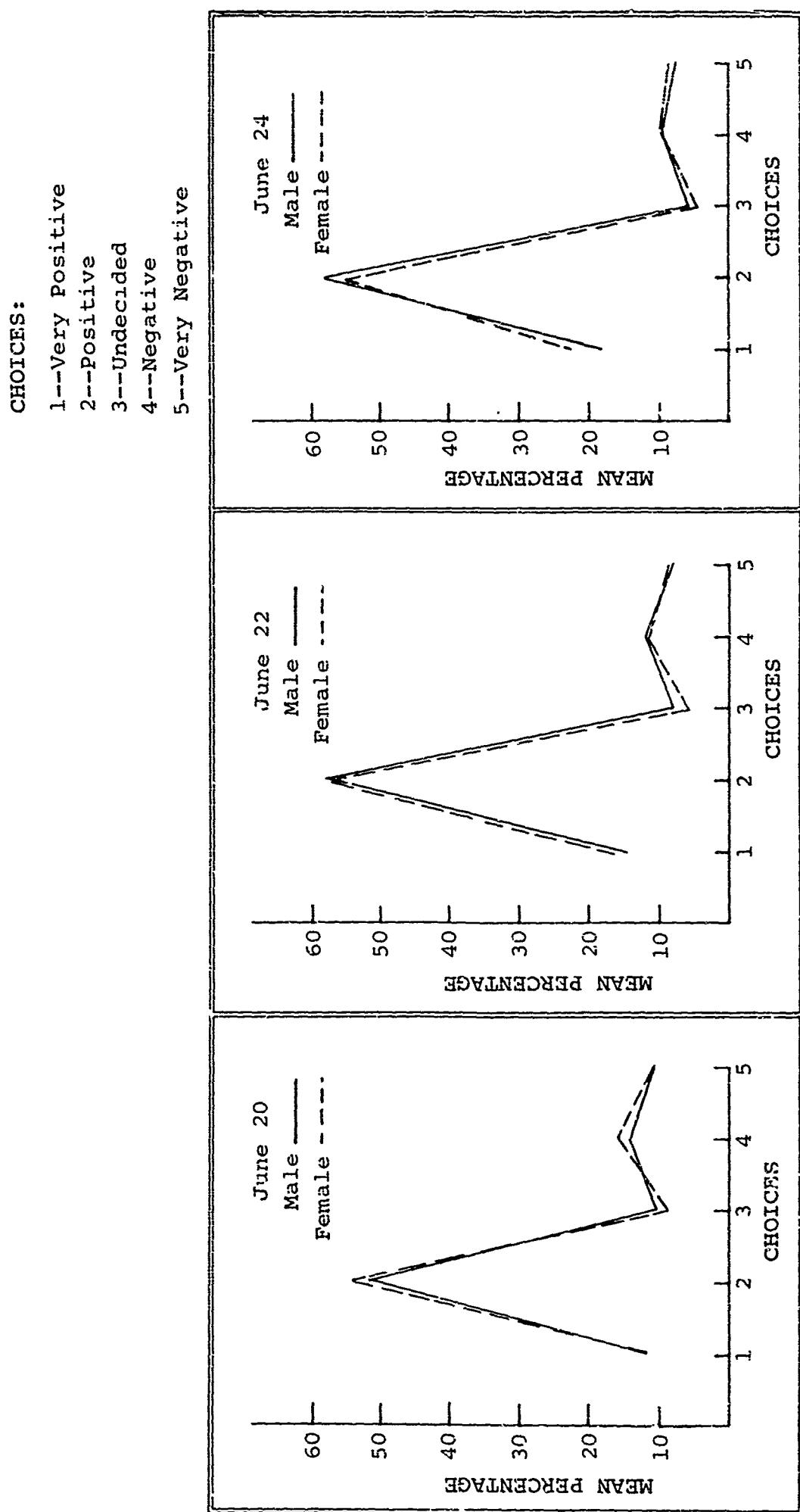


Figure 7. Structured Diaries--Mean positive and negative choice percentages (ES VII).

addition, the undecided category earned a lower mean per cent as confinement progressed.

The sheltrees were asked to rate such variables as activities, sleeping, food and water, temperature, toilet conditions, endurance, and morale.

a. Activities

When asked about activities, the majority of sheltrees reacted favorably, with the highest percentage of responses occurring in the "Satisfactory" or positive category. Overall positive percentages began high (72% for males, 88% for females for June 20) and tended to increase so that by June 24 the percentage of overall positive responses for activities was 91% for males and 94% for females. The percentage of overall negative responses was less than 10% with the exception of the negative responses of males for June 20 which reached 19%.

b. Sleeping

When questioned about sleeping conditions, again the highest percentage of responses for any one choice occurred in the positive category. However, when the overall positive ("Very Satisfactory" and "Satisfactory") and overall negative ("I do not like it" and "Terrible") categories were compared, they were found to be very close (males, 45% positive, 52% negative; females, 44% positive, 52% negative) on June 20. On June 22 and 24 over 50% of the responses were positive for both males and females while the overall negative responses dropped and remained around 35%.

When asked "How did you sleep last night?" both males and females seemed to sleep better as time progressed. The apparent disparity between the increasingly favorable diary comments concerning sleep and the night-duty physician's report of an increase in insomnia may be accounted for by the fact that the physician successfully treated insomnia complaints. For males overall positive (combined response categories of "Well" and "All Right") comments jumped from 53% on June 20 to 74% on June 24, while overall negative (combined response categories "Not at all well" and "It was miserable") comments decreased from 41% on June 20 to 21% on June 24. For females the same trend is evident; the percentage of overall positive ratings increased from 47% on June 20 to 74% on June 24 while overall negative comments continually decreased from 49% on June 20 to 23% on June 24.

#### c. Food and Water

Over 60% of male and female responses to the question about water were positively oriented (either "Very Satisfactory" or "Satisfactory"), and this percentage increased over the confinement period. Overall negative comments ("I do not like it" or "Terrible"), on the other hand, decreased without exception (males from 34% on June 20 to 24% on June 24; females from 33% on June 20 to 20% on June 24).

The percentage of overall positive comments ("Very Satisfactory" and "Satisfactory" categories) for food was relatively lower than for water on June 20 for both males and females. Thereafter, the percentage dropped steadily for the females (from 50% on June 20 to 45% on June 24), while overall negative comments ("I do not like it" and "Terrible" categories) increased from 48% on June 20 to 50% on June 24. Food was also viewed with less enthusiasm by the males as time progressed, with a greater percentage of negative comments occurring on June 24 (48% overall positive comments and 52% overall negative comments). Therefore, it would seem that tolerance for the water increased somewhat over confinement, whereas tolerance for the food decreased.

#### d. Temperature

Temperature for both night and day was given a high positive rating for the three days by males and females. Overall positive ratings ("Very Satisfactory" and "Satisfactory" categories) for day and night temperature for June 20 and June 22 were about 75% while overall negative ratings ("I do not like it" and "Terrible" categories) were below 25%. Overall positive ratings for night temperature on June 24 were above 75% and for day temperature were above 80%, while overall negative ratings were below 17% for both night and day temperature. These percentages tend to indicate that the shellees were increasingly satisfied or adapted to temperature aspects of the study as time progressed.

#### e. Toilet Conditions

When asked to convey their feelings about toilet conditions the shellees departed from their usual tendency toward positive orientation. There was a definite deterioration in attitude toward the toilet conditions across the days of confinement as evidenced by decreasing overall positive ratings ("Very Satisfactory" and "Satisfactory" categories) (males from 51% on June 20 to 41% on June 24; females from 39% on June 20 to 25% on June 24). Most impressive of all, however, is that overall negative ratings ("I do not like it"

and "Terrible" categories) were much higher for this particular area than for any other question on this structured form. Overall negative ratings for males and females respectively were: June 20, 44%; June 22, 56%; June 24, 56%; June 20, 59%; June 22, 64%; June 24, 73%. From all indications, toilet conditions were the least desirable aspect of the entire study, especially for the females.

f. Shelters' Perseverance

Another departure from the uniformity of ratings was observed when the shelters were asked if they could complete the study. The highest percentage for this question occurred in the very positive ("I am sure I can") category with males rating 46%, 55%, and 80% for June 20, June 22, and June 24 respectively. Overall negative responses ("I do not think so" and "I want to leave now" categories) were extremely low (less than 2%). The increase of very positive ratings indicates that the males became progressively more certain of completing the study. For the females, positive ("I think so") responses of 50% and 46% for June 20 and June 22 were noted. For June 24 a very positive response ("I am sure I can") of 73% was observed. Overall negative responses for females were below 2%, with the exception of June 20 when the percentage was less than 8.

g. Morale

Figure 6 shows the mean per cent of males and females selecting Choices 1 through 5 for June 20, June 22, and June 24. This figure indicates that overall positive ratings on June 20 were a little lower than on June 22 and June 24, with females responding slightly higher. Somewhat higher positive responses for June 22 and June 24 as compared to June 20 may possibly indicate a slight rise in morale. Negative ratings for males and females, as indicated by Figure 6, decreased as confinement progressed.

h. Comparison of Age Groups 8-16 and 31-50

A comparison of age groups 8-16 and 31-50 for males and females for June 20, June 22, and June 24 revealed a general trend similar to that of all age groups combined. Positive ratings were those most often given by these groups (see Appendix C, Figures C-1 to C-3). Males in the 31-50 age group gave a positive rating of 70% on June 20, 72% on June 22, and 69% on June 24 indicating a slight mid-point rise in positive ratings. Males in the 8-16 age group gave positive ratings of 44% on June 20, 50% on June 22, and 53% on June 24. Comparatively, the younger males were less inclined toward positive ratings than the older males. Resultant

negative ratings were comparable, with the younger males yielding a higher percentage of negative ratings than the older males.

Female positive ratings for age groups 8-16 and 31-50 on June 20, June 22, and June 24 were strikingly similar. Positive ratings for both female age groups were 52% and 52% on June 20, 59% and 58% on June 22, and 54% and 56% on June 24. This similarity indicates no age group differences among females for the positive category. Female negative ratings for age groups 8-16 and 31-50 were also very similar. Percentage differences between the groups were 1.1% on June 20, 0.1% on June 22, and 1.4% on June 24, contraindicating age group differences among females.

i. General Comments Concerning Structured Diary

In comparing overall positive ratings with overall negative ratings, the greatest per cent of ratings (with the exception of the question concerning the toilet) were at the positive end of the scale, with the greatest majority of these positive percentages falling in the Choice 2 or positive category.

Undecided or Choice 3 ratings accounted for a very small percentage of the total responses with two exceptions: The question, "How do the people in your section feel about the study now?" received highest undecided percentages on June 20 for both males and females--33% and 23% respectively--and thereafter tended to diminish. The second question, "How do others in your section feel about you?" also received the highest per cent on June 20 when this category received 44% of the responses for the males and 33% of the responses for females. Decrease in this percentage was also noted in this category across confinement days.

j. Conclusions

1. The majority of shellees cended to be positively oriented toward aspects of their shelter environment and other people.
2. One outstanding exception to the above observation concerned toilet conditions. Other environmental conditions receiving a relatively higher percentage of negative responses were food and sleeping conditions. Space and sanitation were not listed as items to rate and therefore were not evaluated in the structured diaries.

### C. Post-Shelter Questionnaire

The Post-Shelter Questionnaire was administered on the day prior to the group's emergence from the shelter. A total of 202 persons (91 males and 111 females) aged 8 to 67 completed the form. The discussion which follows is based on their report.

#### 1. Adjustment to Shelter Living

In Part I of the questionnaire an effort was made to get an idea of the subjects' adjustment to shelter life. The first question required that each subject estimate the number of days he could remain in the shelter under the same conditions. Table 17 presents the responses to this question for males and females and the total group. The average estimate for males was 8.1 days (median, 4.1 days); for females, 3.7 days (median, .5 days).

Two questions revealed a favorable attitude on the part of the subjects toward their stay in the shelter (see Table 18). Seventy-nine per cent said that they would have volunteered to stay in the shelter if they had known what it would really be like, and 71% indicated that they would be willing to volunteer to stay in the shelter again.

The sheltenees were asked to list any items they felt definitely should be added to the shelter stocks. Two principal suggestions were given: (a) a food other than the crackers, and (b) improved toilets.

Another question sought to establish what one item the sheltenees wished they had brought into the shelter with them. Food was the most frequent response to the question. Next in priority were various aspects of bedding such as mattresses and pillows, such wishes probably coming from persons who had failed to bring these articles.

When asked to mention articles which they had brought with them into the shelter but which could have been left at home, the sheltenees were reluctant to mention anything. If anything at all was volunteered, it was clothing.

#### 2. Primary Discomfort Factors

The second part of the questionnaire was designed to ascertain the factors contributing to the discomfort of the sheltenees. The sheltenees were asked to choose from among seventeen listed factors and to rank those they considered to be discomforts. Food as a discomfort factor was omitted from the list of potential discomforts, since past measures of this sort have indicated food to be the primary complaint. A large number of the

Table 17

**Shelteree Estimates of Tolerance  
for Continued Confinement  
(ES VII)**

Additional Days	Number of Estimates		
	Total Group	Males	Females
0-4	125 (63.6%)	49 (52.7%)	77 (73.3%)
5-9	37 (18.7%)	19 (20.4%)	18 (17.1%)
10	8 (4.0%)	6 (6.4%)	2 (1.9%)
15	5 (2.5%)	3 (3.2%)	2 (1.9%)
20	3 (1.5%)	2 (2.2%)	1 (1.0%)
30	19 <sup>a</sup> (9.6%)	14 (15.1%)	5 (4.8%)
--	--	--	--
<b>Total Responses</b>	<b>198</b>	<b>93</b>	<b>105</b>
<b>Mean Estimate</b>	<b>5.8 days</b>	<b>8.1 days</b>	<b>3.7 days</b>
<b>Median Estimate<sup>b</sup></b>	<b>1.9 days</b>	<b>4.1 days</b>	<b>.5 days</b>

<sup>a</sup>Sixteen of the nineteen persons giving 30-additional-days-in-shelter estimates were thirty years of age or younger.

<sup>b</sup>This figure is more representative of the shelterees' estimates.

Table 18

Shelteree Evaluation of  
Shelter Adjustment  
(ES VII)

Question	Per Cent Yes		
	Total Group	Males	Females
Would you have volunteered to stay in the shelter if you had known what it would really be like?	79 (N=160)	79 (N=72)	79 (N=88)
Would you volunteer to stay in this shelter again sometime?	71 (N=144)	77 (N=70)	66 (N=74)

comments registered in the "other things" category referred to food. While most of them complied with the request to indicate discomforts, the ranking of these was not done correctly by enough persons to warrant consideration in this discussion. The frequency of selection and percentage of persons making each selection is presented in Table 19.

Eight sources of discomfort were indicated by more than one-third of the persons who completed the questionnaire. In order of frequency of mention, these were: no bathing, toilets, dirty, space, noise, smells, water, and couldn't sleep. These primary points are discussed in the following paragraphs in order of frequency of mention.

"No bathing" appeared as the greatest discomfort, being selected by 78% of the sheltrees. More specific examination of this factor as a discomfort merely indicates that the sheltrees were bothered by not being able to bathe or have a routine change of clothing. The generally unsatisfactory unclean conditions in the shelter enhanced the discomfort of being unable to bathe. Undoubtedly other discomforts mentioned by more than one-third of the sheltrees, i.e., "toilets" and "dirty," were related to this being such a major discomfort.

The major complaints concerning the toilet facilities focused on the smell (79% of the sheltrees cited this as an unpleasant phenomenon), lack of privacy (mentioned by 45% of the group), and inadequate number of toilets for the size of the shelter group (mentioned by 38% of the group).

Sixty-eight per cent of the sheltrees complained that the shelter was "dirty." The unanimity of this opinion among the group points to the constellation of related factors which apparently made sanitation the primary problem during confinement.

"Space" was cited as a discomfort factor by 65% of the group. Commenting further on this phenomenon, more than one-half of the population stated that there simply was not enough space for the number of people involved. Almost as many persons clarified this feeling by saying that some people took up more space than they should have, and it is likely that such "space hogs" were those who had mattresses and other bulky possessions with them.

A complaint fifth in rank and registered by 54% of the sheltrees was that of noise. Evidence from sources other than the Post-Shelter Questionnaire indicates that a possibility for this becoming such a dominant problem was the uncontrolled playfulness of the children.

"Smells" were a complaint from one-half of the group. When asked to elaborate on this problem, 80% of the sheltrees

Table 19

**Shelteree Indications of Discomfort  
(ES VII)**

Item	Age					Total Group (N=202)
	8-16 (N=94)	17-23 (N=32)	24-30 (N=17)	31-40 (N=32)	41-50 (N=14)	
No bathing	78% (73)	91% (29)	82% (14)	84% (27)	50% (7)	62% (8)
Toilets	76% (71)	91% (29)	76% (13)	69% (22)	50% (7)	54% (7)
Dirty	71% (67)	81% (26)	53% (9)	63% (20)	50% (7)	62% (8)
Space	71% (67)	72% (23)	47% (8)	66% (21)	50% (7)	31% (4)
Noise	64% (60)	69% (22)	41% (7)	28% (9)	50% (7)	38% (5)
Smells	58% (55)	53% (17)	53% (9)	41% (13)	36% (5)	38% (5)
Water	57% (54)	50% (16)	35% (6)	34% (11)	7% (1)	15% (2)
Couldn't sleep	52% (49)	38% (12)	35% (5)	25% (8)	29% (4)	38% (5)
Boredom	47% (44)	38% (12)	24% (4)	13% (4)	14% (2)	0 (0)
Not enough fresh air	48% (45)	41% (13)	18% (3)	6% (2)	7% (1)	0 (0)
Too warm	31% (29)	34% (11)	29% (5)	3% (1)	14% (2)	0 (0)
Too cool	32% (30)	31% (10)	12% (2)	13% (4)	7% (1)	8% (1)
Other people	30% (28)	41% (13)	24% (4)	6% (2)	7% (1)	0 (0)
Tobacco	28% (26)	34% (11)	18% (3)	3% (1)	0 (0)	8% (1)
Other things	20% (19)	25% (8)	29% (5)	16% (5)	0 (0)	8% (1)
Shelter activities	20% (19)	16% (5)	18% (3)	9% (3)	0 (0)	0 (0)
Not enough tobacco	12% (11)	6% (2)	12% (2)	6% (2)	0 (0)	0 (0)

indicated the toilets as the basic contributor. Over one-third of the group also cited body odors--those of others as well as their own--as problematic.

The water available for drinking was indicated as a discomfort by 45% of the group. Upon further examination, it appears that the taste of the water, its warm temperature, its unavailability at times, and insufficient quantity contributed to this as a primary discomfort factor.

The last discomfort cited by at least one-third of the shelter group who completed the questionnaire was "couldn't sleep." The major reasons given were lack of space and the hard floor. More than one-third of the group also complained that sleeping conditions made parts of the body sore.

Though not included as an item of discomfort to be selected by the sheltrees from among the items discussed above, the respondents were asked later in the questionnaire to evaluate the food stocked in the shelter. Lack of variety was the main complaint registered by 61% of the group. Sixty per cent said the cracker did not have enough taste to it; 59% complained of the dryness of the cracker, tending to produce thirst; 55% indicated that it was too hard; and 53% said the ration was difficult to swallow.

Though asked to comment on shelter recreation, the carbohydrate supplement, smoke, Section Leaders, exercise, shelter activities generally, training lectures, ventilation, personal feelings, and the management of the shelter, the complaints registered were minimal, i.e., recorded by less than one-third of the group.

When invited to indicate on a list the things not available in the shelter but which were nevertheless needed or wanted, 61% of the sheltrees indicated food as the main item. One-third or more of the group also indicated "coffee" (35%) and "radio or TV" (35%).

The only complaint registered by approximately one-third of the group related to other people in the shelter was that the children were a bother. This was cited by 32% of the respondents.

Four factors emerged as the major sanitation problems in the shelter: 63% of the group cited not being able to keep their hands clean; 62%, the chemical commodes; 59%, not being able to bathe; and 58%, keeping the drinking cups clean.

### 3. Conclusions

- (1) When asked to estimate capacity for endurance of an extended stay in the shelter, median estimates for total Ss, males, and females were 1.9, 4.1, and .5 days, respectively; mean estimates were 5.8, 8.1, and 3.7 days, respectively.
- (2) When asked to list additional shelter needs, Ss ranked as primary the need for better food, and better commode conditions.
- (3) Among additional supplies Ss wished they had brought with them were, in relatively greatest importance, food and bedding.
- (4) Primary discomfort factors, chosen from a list of 17 factors by at least one-third of the Ss, in order of priority ranking, were: no bathing, toilets, dirty, space, noise, smells, water, and couldn't sleep.
- (5) In their evaluation of fellow sheltenees, approximately one-third of the Ss listed children as being a bother.

### • Defections

Sixty-two defections occurred during the one-week shelter stay. The daily defection rate is presented in Figure 8.

Reasons for medical and non-medical defections are given in Table 20 and Table 21. An analysis of the defection medical and interview reports resulted in the following observations.

1. The group of sheltenees aged 21-30 accounted for only 3% of the defections (2 out of 62).
2. As compared with males, as many or more females defected in each age range.
3. Females accounted for 61.3% of defections; males, for 38.7%. Of the shelter population, 54.72% were females, and 45.38% were males.
4. Seventy-four per cent of the defections were aged 20 or below.
5. Thirty-four or 55% of the defections were between the ages 6 and 15; however, eight of these left because other family members defected and three because a close family member died.

Table 20  
Nature of Medical Defections  
(ES VII)

Age	Sex	Reported Ailment	Total Ailments
1-5	F	1 Tonsillitis 1 Bronchial spasms	2
	M	1 Tonsillitis 1 Poison ivy	
6-10	F		
	M	1 Allergy with lesions	1
11-15	F		
	M		
16-20	F	1 Gastritis	1
	M		
21-24	F	1 Tonsillitis	1
	M		
26-30	F		
	M		
31-35	F		
	M	1 General weakness	1
36-40	F	1 Claustrophobia and hysteria	1
	M		
41-45	F	1 Sciatic nerve pain	1
	M		
46-50	F	1 Migraine	1
	M		

Table 21

Nature of Non-Medical Defections  
(General Statement of Shelters on Reasons for Leaving)  
(ES VII)

Nature of Defection	Number of Defections by Age Groups																	
	6-10			11-15			16-20			26-35			36-40			41-50		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Too much noise	0	2	2	4	2	6	0	1	1	0	1	1	0	1	1	0	1	4
To accompany parents	1	4	5	4	2	6	0	1	1									12
Disliked food, etc.	0	1	1	2	1	3	1	0	1									5
Too crowded	1	1	2	2	0	2												4
Homesick	1	1	2	0	3	3												5
Would not or could not eat	2	1	3	0	2	2	1	0	1	0	1	1	7					
Did not feel good				1	1	2				0	1	1						2
To help mother							0	1	1									1
Water bad							1	0	1									1
Did not like experience							0	1	1									1
Desperately uncomfortable										1	1	2						2
To accompany children										0	1	1	0	1	1	0	1	3
Inadequate supplies											0	1	1	0	1	1	1	1
Hard time keeping											1	0	1	1	0	1	1	1
Children occupied by self												1	0	1	1	0	1	1
Body aches, Headaches												0	1	1	1	0	1	1
Home emergency												1	0	1	1	0	1	1

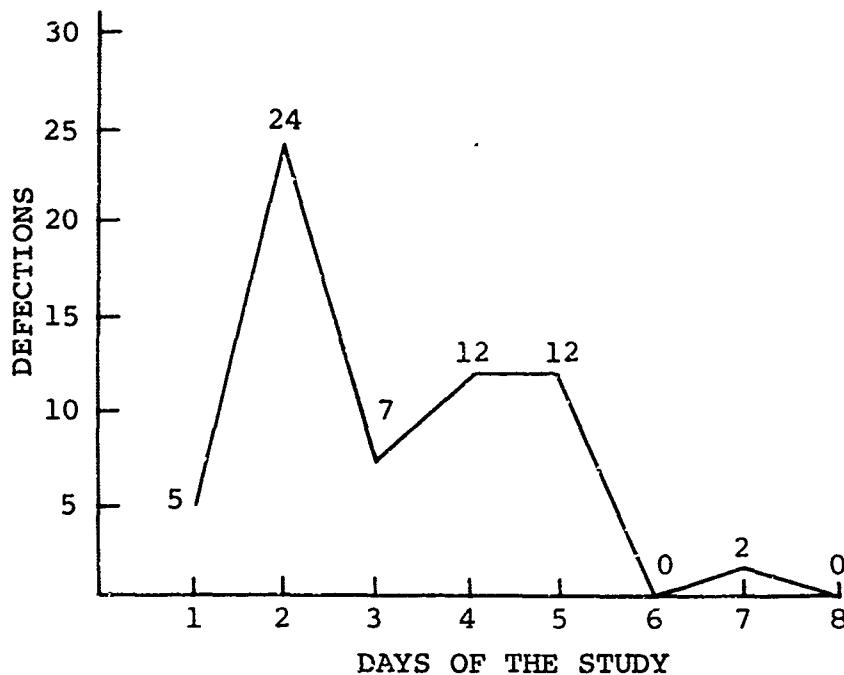


Figure 8. Daily Defection Rate (ES VII).

6. No one over 47 years of age defected, although there were 13 such people in the shelter.
7. Fifty-one of the defections were for non-medical reasons; however, 12 of these 51 left when one or more family members defected.
8. Non-medical reasons for defection included homesickness, bad shelter conditions, and departure of other family members.
9. Eighteen per cent of the defections occurred for medical reasons.
10. The age group 1 to 5 had the largest percentage of medical defections.
11. Three tonsillitis cases were observed as reasons for defections.

#### A. Comparison of Personal Possessions of Defectees and Non-Defectees

At time of entry and again on the last day of the shelter stay shelterees were asked to complete a Possession Inquiry form. The resultant data are given in Appendix E, Table E-1. The following general observations may be made:

1. In general, those who defected listed fewer items than non-defectees.

2. Many sheltterees did not list non-essential items on the last day.
3. Items on which there was at least 10 percentage points difference between defectees' and non-defectees' pre-shelter listing, wherein defectees listed less than non-defectees, included books, underwear, comb, cards, candy, shirt or blouse, pen and pencils, paper, radio, toothpaste, shorts. Only a one percentage difference between defectees' and non-defectees' pre-shelter listing, wherein defectees listed more than non-defectees, was found for these items: blanket, chewing gum, brush, pocketbook, cosmetics.
4. Items on which there was the greatest difference between defectees' and non-defectees' post-shelter listing, wherein defectees listed less than non-defectees, included candy, change of clothes, air mattress, pen and pencils, bed sheet, quilts, underwear.
5. Items on which there was the greatest difference between defectees' and non-defectees' post-shelter listing, wherein defectees listed more than non-defectees, included toothbrush, toothpaste, chewing gum, brush, pocketbook, cosmetics.
6. In general, defectees carried more non-essential and fewer essential items than those who did not defect.

#### B. Defection of Children with and without Parents

Children who defected for non-medical reasons were compared to a sample of non-defecting sheltterees matched in age and sex. A Chi-Square Test of statistical significance revealed no significant difference between the number of non-medical defections who had parents in the shelter and the number of non-defections who did not have their parents with them.

#### C. Newspaper Reading Habits and Defections

A sample of non-defecting sheltterees was picked to match, both by age and sex, the group of sheltterees who defected. Using this sample of non-defecting sheltterees as a basis for deriving expected values, a Chi-Square Test of statistical significance was performed with the result that no significant difference was found between the newspaper reading habits of defectees and those of non-defectees.

#### D. Income and Defections

A sample of non-defecting sheltterees was picked to match the group of non-medical defections both as to sex and age. A Chi-Square Test was performed on the income of the defectees as compared to the income of the non-defectees. The test revealed that

there was no significant difference in incomes.

#### E. Previous Family Problems and Defections

Two random samples, one a group of sheltrees who defected during the study but who had completed the Questionnaire, and the other a sample of those who stayed the entire week, were compared with reference to the following question: "What problems have your family been through in recent years?" The sheltree was to check the applicable of the following alternatives: (1) death of a family member, (2) divorce, (3) mental illness, (4) medical operation, (5) unemployment, (6) imprisonment, (7) school dropout, (8) alcoholism, (9) general family problems, (10) other (please specify), and (11) none.

It might be hypothesized that non-defectees had coped more successfully with past difficulties, and that this experience helped them endure shelter stress. Defections, on the other hand, might be those who lacked experience dealing with group difficulties, and who would be more likely to leave. A Chi-Square Test of statistical significance supported the hypothesis. That is, non-medical defections had not coped with as many family problems as those sheltrees who did not defect.

#### F. Civil Defense Knowledge and Defections

A Chi-Square Test on differences between the group of non-medical defections and a sample from the non-defecting shelter population matched in age and sex indicated no significant difference in knowledge of Civil Defense information.

## Chapter 11 - Environmental Variables

### I. Temperature and Ventilation

Each day the dry bulb temperature inside and outside the shelter increased to a maximum level, which was usually attained in the afternoon, and then dropped again in the evenings. The inside temperature was always slightly lower than the outside temperature during the hotter portions of the day, indicating that the fans were effective in cooling the shelter. However, this does not rule out the possibility that the heat absorbed by the building itself was responsible for the cooler inside temperatures. Structural data for use in evaluation of the thermal environment in the shelter was forwarded to OCD for calculation by computer methods.

Each day during the test the inside wet bulb temperature was slightly less than or equal to the outside wet bulb temperature, with the exception of the first day. On the first day, the fans were all off as shellees entered. The wet bulb temperature inside the shelter began to climb rapidly at 12:00 noon and reached a maximum of 73.7°F at 4:00 P.M. At 4:30 P.M. the fans were turned on (Condition 3), and the inside wet bulb temperature dropped to 64.8°F by 5:00 P.M., while the outside wet bulb reading remained fairly constant.

The Temperature-Humidity Index (THI) inside the shelter was approximately equal to the THI outside the shelter, except for the first day. On the first day, the inside THI was higher during the hotter part of the day when fans were off. (For detailed temperature and ventilation data, see Tables 22-26 and Appendix D.)

These results indicate that the present ventilation equipment was adequate for the shelter with outside dry bulb temperatures in the 80s.

The overall mean daily Temperature-Humidity Index (computed on power psychrometer readings) was 75.7°F, with the lowest index being 73.6°F on 19 June, and the highest index being 77.2°F on 25 June.

In the future, shellees could control the in-shelter temperature to some degree by the following procedures (which should be clearly stated in the Handbook):

#### A. If the shelter is too warm:

1. Keep shellees inactive during hot portions of the day, and provide any exercise at night.
2. Move people from hotter areas to cooler ones.
3. Remove extra clothing.

Table 22

Ventilation Conditions  
(ES VII)

Condition	Description
1	During day when hot and early morning: 3 Observation area fans - on exhaust 5 In-shelter fans - on intake (High)
2	During evening - 6 P.M. to 11 P.M.: 3 Observation area fans - on exhaust 5 In-shelter fans - on intake (Medium)
3	When humidity was high outside or during night and moderate temperature: 3 Observation area fans - on exhaust 5 In-shelter fans - Off
4	During night and cool: 1st floor attic fan - On 2nd floor attic fan - On 4th floor attic fan - Off 5 In-shelter fans - Off
5	During night and cold - 12 P.M. to 6 A.M.: 3 Observation area fans - Off 5 In-shelter fans - Off

Table 23

Dry Bulb Temperature ( $^{\circ}$ F)  
(ES VII)

Location of Reading	Instru- ment Used <sup>a</sup>	June 19				June 20				June 21				June 22			
		Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.
Outside	P. Psy.	84	69	77.7	4.7	88	59.5	74.5	9.2	87	65	77.6	7.6	89	69.5	79.5	6.7
Room A	P. Psy. Therm.	81 80	71 71	78 77.1	3.2 3.3	83 83	73.5 79.7	79.8 2.8	3.1 85.5	85.5 76	75 82.1	81.6 2.9	3.0 87.5	76 75	82.2 82.7	82.2 3.0	
Room B	P. Psy. Therm.	82.5 81	71 71	78.9 77.5	3.7 3.1	84 84	75.5 80.8	80.9 2.8	2.6 88	85 76	82.2 82.6	82.2 3.5	2.9 86	86 77	82.3 82.8	82.3 2.5	
Room C	P. Psy. Therm.	82 78.9	72 71	79 76.2	3.1 2.7	84 82	76 75	81.6 79.5	2.6 1.9	85 88	78 77	83 82.8	2.3 2.7	86 85	78 78	83.5 82.7	83.5 1.5
Room D	P. Psy. Therm.	81 82.5	74 75	78.8 79.2	2.6 2.6	84 85	76.5 76	81.5 82.6	2.1 2.3	85.5 89	78 80	82.7 84.4	2.3 2.5	86.5 88	79 77.5	83.7 84	83.7 2.7

(Contd.)

Table 23 (Contd.)

Location of Reading	Instru- ment Used	June 23				June 24				June 25				June 26			
		Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.
Outside	P. Psy.	91	72	81.3	6.7	87	74	79.0	4.6	89	71	78.3	5.4	73.5	71	71.9	.9
Room A	P. Psy. Therm.	86.5 85.5	79 75	83.7 82.3	2.1 2.7	85 84	78.5 75	81.9 80.8	2.1 2.2	84.5 82	78 74	81.2 79.8	1.9 2.3	76 74	75	75	.5
Room B	P. Psy. Therm.	87 86	80 74.2	83.8 82.8	2.0 2.9	86 83	79.8 74	82.5 79.9	2.5 2.2	84 82	80 74	82.2 79.8	1.6 1.9	76 72	72	74.1	1.2
Room C	P. Psy. Therm.	87.5 84	80 76	84.4 82	2.0 2.0	86 84	80 77	83.2 81.1	2.2 1.7	84 81	80 75	82.6 79.9	1.4 1.3	76 78	75	76.4	1.0
Room D	P. Psy. Therm.	87.5 85	80 74	84.4 82.9	2.2 2.5	85.5 84	79 76.2	82.6 81.6	2.2 1.7	85 83	80 76	82.6 81.5	1.9 2.3	78 75	75	76.3	.9

<sup>a</sup>Instrument abbreviations used are:

- 1) P. Psy. - Power Psychrometer.  
 2) Therm. - Thermistor.

Table 24

 Temperature-Humidity Index ( $^{\circ}\text{F}$ )  
 (IES VII)

Location of Reading	Instru- ment Used	June 19						June 20						June 21						June 22												
		Max.			Min.			Mean			S.D.			Max.			Min.			Mean			S.D.			Max.			Min.			
		P.	Psy.		P.	Psy.		P.	Psy.		P.	Psy.		P.	Psy.		P.	Psy.		P.	Psy.		P.	Psy.		P.	Psy.		P.	Psy.		
98	Outside	74.7	66.8	70.9	2.4	78	61.5	70.3	5.4	77	65	72.3	4.2	79.5	68.5	74.3	3.8															
	Room A	THIM	75	69	72	2.1	75.5	69	73.1	2.0	75.5	71	74.3	1.3	75.5	70.5	74.3	1.7														
		P. Psy.	76.5	68.5	73	2.4	74.9	70	73.1	1.5	75	71	74.4	1.5	77.2	72.2	75.8	1.4														
		Therm.	77.2	70.2	74.6	2.1	77.2	73.2	75.4	1.2	78.2	74.3	76.9	1.3	80.5	74.5	77.8	1.7														
	Room B	THIM	80	70	73.6	3.5	75	71.5	74.3	1.1	80	72	75.2	1.5	80.2	75	76.3	1.5														
		P. Psy.	78	69	74	2.8	75	71.5	73.9	1.1	75.9	72	74.7	1.2	78	73	76.8	1.4														
		Therm.	78	71	74.9	2.1	80.8	74.2	76.7	1.7	81.5	75	77.9	1.8	81.5	76.1	79.1	1.8														
	Room C	THIM	75	69	72.7	2.1	75.5	70	74.5	1.3	80	73	75.5	1.4	80	75	75.9	1.3														
		P. Psy.	77	68.6	73.8	2.1	75.8	71.5	74.5	1.2	76.9	73	75.4	1.1	77.9	74	76.7	1.1														
		Therm.	77.2	70.2	74.2	1.9	77	74.8	75.9	.6	79.5	75	77.1	1.2	79.8	76.1	77.9	1.3														
99	Room D	THIM	75	69.5	72.5	1.8	80	72	74.7	1.7	80	74	75.2	1.4	76	75	75.4	.3														
		P. Psy.	76.5	70.2	73.4	2.0	75.1	72	74.3	.8	76.9	72.8	75.2	1.0	77.8	74	76.7	1.2														
		Therm.	78.2	73	75.9	1.4	79.5	73.3	78.1	1.5	80.4	76.9	79	1.3	81	75.9	78.9	1.3														

(contd.)

Table 24 (Contd.)

Location	Instrument	June 23						June 24						June 25						June 26					
		Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.
Outside	P. Psy.	79.9	70	75.2	3.4	79.5	72	74.8	2.7	81	71	74.8	3.1	71	69.5	69.9	.5								
Room A	THIM	76	75	75.4	.3	77	74.7	75.4	.6	76	70.5	74.7	1.3	-	-	-	-	-	-	-	-	-	-	-	
	P. Psy.	77.6	74	76.4	.9	78.5	74.4	76.6	1.2	78.3	75	76.6	1.0	-	-	-	-	-	-	-	-	-	-	-	
	Therm.	78.7	73	76.9	1.6	79.3	75.5	77.4	1.2	78.7	73.9	77.1	1.5	74	71.8	72.9	.8								
Room B	THIM	77.5	75	75.8	.7	78	70.5	75.3	1.7	77.5	75	75.6	.9	-	-	-	-	-	-	-	-	-	-	-	
	P. Psy.	77.2	75	76.5	.7	78.9	74.2	76.8	1.4	78.3	76	77.2	.9	-	-	-	-	-	-	-	-	-	-	-	
	Therm.	78.7	75.5	77.2	1.0	78.7	75	77	1.1	80	75.9	77.9	1.2	75.8	72.7	74.4	1.0								
99 Room C	THIM	77	75	75.5	.5	77.5	75	75.9	.9	77.5	70	75.2	1.8	-	-	-	-	-	-	-	-	-	-	-	
	P. Psy.	77.9	75	77	.8	79	75.1	77.3	1.3	79	76	77.6	.9	-	-	-	-	-	-	-	-	-	-	-	
	Therm.	78.2	73.8	77.1	1.1	79	75.2	77.6	1.2	78	74.6	77.1	.9	75	73	73.9	.6								
99 Room D	THIM	76	75	75.3	.3	77	75	75.5	.7	76.5	74.5	75.4	.5	-	-	-	-	-	-	-	-	-	-	-	
	P. Psy.	79	74.5	77	1.0	78.8	74.7	76.9	1.2	78.5	75.8	77.2	1.0	-	-	-	-	-	-	-	-	-	-	-	
	Therm.	79.5	74.2	78.4	1.4	80.2	76.4	78.3	1.1	81	75.3	78.5	1.5	75.4	72.6	73.8	.7								

aInstruments used are abbreviated as follows:

- 1) THIM: Temperature-Humidity Index Meter
- 2) P. Psy.: Power Psychrometer
- 3) Therm.: Thermistor

Table 25

Wet Bulb Temperature ( $^{\circ}\text{F}$ )  
(ES VII)

Location of Reading	Instru- ment Used	June 19						June 20						June 21						June 22					
		Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.
Outside	P. Psy.	65	59	61.9	1.7	70	57	63.9	4.2	69	60	65.6	3.0	71.8	63.8	68.5	3.0								
Room A	P. Psy.	74	62	67.1	4.5	67	64	65.5	0.9	69	65	66.8	1.1	71.5	67.5	69.9	1.0								
	Therm.	76	66	70.9	3.4	73.5	67	70.7	1.7	76	70.5	72.2	1.2	76	69	72.8	2.2								
Room B	P. Psy.	75	63	67.8	4.4	68	65.2	66.5	1.0	69	66	67.2	0.8	72.8	68	71.1	1.2								
	Therm.	78	66	71.8	3.6	82	70	74.0	3.5	83	69	76.4	4.1	82	71	77.5	2.9								
Room C	P. Psy.	73.5	62	67.3	3.1	68.5	65.5	67.0	0.8	70	66.5	67.9	1.1	72	69	70.9	0.9								
	Therm.	77.8	66	71.4	3.3	78	69	73.3	2.1	76	70	72.7	1.5	78	70.5	74.2	1.9								
Room D	P. Psy.	73	62.5	66.8	3.3	69	65.5	66.8	1.0	70	65.5	67.5	1.1	71	68.5	70.3	0.7								
	Therm.	77	69	72.3	1.9	78	70	74.5	2.0	82	71.5	75.8	2.7	77	71.5	74.5	2.1								

(Contd.)

Table 25 (Contd.)

Location of Reading	Instru- ment Used <sup>a</sup>	June 23				June 24				June 25				June 26			
		Max.	Min.	Mean	S.D.												
Outside	P. Psy.	71	66	69.2	1.9	75	68	70.6	2.2	76	68	71.2	2.7	66	64	65	0.7
Room A	P. Psy.	71.5	68	69.9	0.9	73.5	70	72.0	1.1	74.5	71.5	72.9	0.8				
	Therm.	75.5	68	72.0	2.0	76.8	71	73.9	2.1	77	68	73.9	2.6	72	67	69.7	1.7
Room B	P. Psy.	72	69	70.2	0.8	73.7	70	72.3	1.1	75	72	73.3	1.0				
	Therm.	77	70.2	73.2	1.9	76.5	72	74.7	1.2	81	72	76.2	2.2	76	72	74.1	1.3
Room C	P. Psy.	72	70	70.5	0.7	74	70.5	72.6	1.0	75	72.5	73.8	0.9				
	Therm.	75	70	72.6	1.7	78	70	73.9	2.2	77	69	74.0	2.2	72.5	69	70.7	1.2
Room D	P. Psy.	75	69	70.5	1.5	74	70	72.3	1.1	74.6	72	73.1	0.8				
	Therm.	77.5	70	74.2	1.6	79	72	75.5	2.2	79	72	75.7	2.2	73	69	70.6	1.2

<sup>a</sup>Instruments used are abbreviated as follows:

- 1) P. Psy.: Power Psychrometer
- 2) Therm.: Thermistor

Table 26  
Selected Sample of Dry Bulb Temperatures  
(ES VII)

Date and Time	Temperature Outside Shelter (°F)	U.S. Weather Bureau Airport Temperature (°F)
June 19:	7:00 A.M.	not recorded
	11:00 A.M.	not recorded
	1:00 P.M.	79.5
	5:00 P.M.	83
	9:00 P.M.	74
June 20:	7:00 A.M.	64.5
	11:00 A.M.	82
	1:00 P.M.	85
	5:00 P.M.	84
	9:00 P.M.	75.6
June 21:	7:00 A.M.	68
	11:00 A.M.	86
	1:00 P.M.	86.5
	5:00 P.M.	85.2
	9:00 P.M.	79
June 22:	7:00 A.M.	71
	11:00 A.M.	87
	1:00 P.M.	89
	5:00 P.M.	86
	9:00 P.M.	80.5
June 23:	7:00 A.M.	72
	11:00 A.M.	88.5
	1:00 P.M.	90.5
	5:00 P.M.	89
	9:00 P.M.	81.8
June 24:	7:00 A.M.	75
	11:00 A.M.	87
	1:00 P.M.	79
	5:00 P.M.	84
	9:00 P.M.	76
June 25:	7:00 A.M.	71.5
	11:00 A.M.	81
	1:00 P.M.	89
	5:00 P.M.	83
	9:00 P.M.	76

4. Forbid smoking.
- B. If the shelter is too cold:
1. Have sheltrees put on all clothing available.
  2. Seal up cracks where drafts originate.
  3. Exercise often, contingent on food rations.
  4. Increase food intake, if supplies are adequate.

## II. Simulated Radef Input

In ES VII, a program was devised for simulating Radef inputs, which could later be expanded and integrated with other EOC program materials. However, certain instrumental difficulties occurred, and the Radef program was abandoned.

## III. Shelter Supplies

### A. U. S. Army Engineer Research and Development Laboratories Sanitary Vault

As previously noted, CDR coordinated with the U. S. Army Engineer Research and Development Laboratories, Ft. Belvoir, Virginia, on the testing of a sanitary vault. Final analysis of the collected data on the use of this equipment, as well as information on various commode chemical tests, will be given in the USAERDL Final Report. Meanwhile, preliminary data evaluation indicates that the dual-purpose metal drum, an OCD-stocked item, appears to be a reasonable and effective method for handling human wastes.

### B. Sanitation Kit IV

There was some confusion during the temporary phase regarding the terms "chemical commode" and "Sanitation Kit IV." It was not clearly conveyed to the sheltree staff through the Handbook that these two terms, in this instance, were synonymous.

In the male and female Commode Areas on the first floor of the shelter, chemical commodes were utilized during the temporary phase of the study. Upon the completion of this phase, the ERDL sanitary vaults were made operational. The Commode Areas on the second floor were in operation during the permanent phase of the study. The female Commode Area contained a USAERDL sanitary vault while a chemical commode was used in the male Commode Area throughout the study.

Although there were many complaints regarding unpleasant commode odors, chief complaints seemed to be directed toward the USAERDL sanitary vaults. It should be remembered, however, that the sanitary vaults were in all of the Commode Areas except one (upstairs male) for most of the study, and therefore they were more likely to be the target of odor complaints.

Toilet tissue was used excessively and would not have lasted through a 14-day period at the same rate of consumption. In some instances women took "baths" in the Commode Area and used toilet tissue as "towels." Only 30% of the supply remained at study termination.

Approximately 57% of the stocked sanitary napkin supply was used. Shelters were allowed to use their discretion in bringing anything they thought was necessary for survival, but only five shelters took a supply of sanitary napkins into the shelter with them, as reported on the pre-shelter confinement questionnaire.

The paper cups stocked in the SK IV were inadequate during ES VII. By Sunday many of the cups were leaking, and by Tuesday this factor became an overwhelming complaint. When water was left in the cups they tended to weaken, and often the bottoms fell out. The quantity stocked created another complaint. Several shelters resorted to making triangular paper cups for their water or using empty fruit juice cans when the OCD cup supply was exhausted. If shelters had made cup racks as suggested in the Handbook, this problem may not have become so critical. A supply of styrofoam cups was sent into the shelter by the Civil Defense Research staff on Wednesday, June 23, to help alleviate the problem.

The prescribed water dispensing method was only partially successful, even with the additional one foot added to the length of the hose in the new SK IV. When siphon action failed, the plastic bag liners were sometimes slit to enable manual adjustment of the siphon hose. Food tins were used to catch frequent spillage of water during the dispensing process.

There were no complaints of bag liner leakage during this study. Some of the bag liners were used as receptacles for trash or dirty cloths, and at times were used to cover food tins.

When the shelters secured the shelter, they did not tie off used commodes properly, e.g., fastening plastic bag liners with provided tie wires. This omission coupled with such things as improper water dispensing methods, stresses the continued need for greater emphasis on proper sanitation procedures.

The can opener provided in the SK IV appeared adequate but again left jagged edges on the food tins. However, there were no recorded complaints of cut hands or fingers.

Recommendations with regard to SK IV will be found after discussion of ES VIII in another section of this report.

#### C. Medical Kit C

Medical Kit C, prepared and supplied by the Office of Civil Defense for 300-325 shelter occupants and designed to meet their medical needs for up to two weeks, was stocked in ES VII. The Kit was used by three medical teams, each comprised of one physician and one registered nurse.

An inventory of items used for medical treatment during ES VII is presented in Table 27. After one week of confinement there were additional supplies of all items remaining in the kit. Extrapolating from the items used during one week to what would be used during a two-week confinement, it appears that the only item which might not be sufficient for two weeks is the supply of wooden tongue depressors. However, the fact that trained medical personnel were solely in control of the Medical Kit could have effected the use of some items to a greater or lesser extent than if the items used were in the hands of non-medical persons. It should also be taken into consideration that the physicians had with them their medical bags with such items as Robitussin, Benylin expectorant, Codinyl cough syrup; Stelazine and Compazine spansules; elixir of phenobarbital and elixir of Benadryl; Maalox, Gelusil, and Donnatal. (See medical complaint records for use of these items.) In-shelter physicians were permitted to have their medical bags for use in possible medical emergencies.

The post-shelter comments of the three physicians and three registered nurses who assisted in ES VII are summarized in Chapter 10. A summary of the medical complaints registered with a medical team during ES VII is also presented in Chapter 10.

#### D. Food and Water

Of OCD stocks, shellees consumed approximately 1/4 lb. crackers/person/day, 1/8 lb. carbohydrate supplement/person/day, and 1 qt. water/person/day (see Table 28) giving a total of approximately 776 calories/person/day. In addition, shellees brought in food adjuncts, such as candy, gum, fruit, or cookies. Since shellee consumption of food adjuncts was an uncontrolled variable, the total daily caloric intake per person is unknown.

#### E. Inventory of Shelter Provisions

Expended and unexpended shelter supply items are presented in Table 29.

Table 27

Medical Kit C Provisions<sup>a</sup>  
(ES VII)

Item	Stocked	Used	Unused
Aspirin tablets, 5 gr.	3,000	482	2,518
Cascara Sagrada Ext. tablets, 4 gr.	600	40	560
Eugenol, 1 oz. bottle	1	1/3	2/3
Eye & Nose Drops, 1/2 oz. bottle	18	2 1/2	15 1/2
Isopropyl alcohol, 1 qt. container	6	2 1/2	3 1/2
Kaolin & Pectin Mix., 40 grams. bottle	16	3	13
Penicillin G. tablets, 250,000 units	1,200	49	1,051
Petrolatum, white, 1 lb. can	3	1/3	2 1/3
Phenobarbital tablets, 1/2 gr.	3,000	256	2,744
Soap, surgical, 1 3/4 oz. bars	36	8	28
Sodium bicarbonate, 1 lb. bottle	2	1/2	1 1/2
Sodium chloride, 1 lb. bottle	2	1/3	1 2/3
Sulfadiazine tablets, 7 1/2 gr.	3,000	27	2,973
Water purification tablets	600	268	332
Bandage, gauze, 2 in. x 6 yds. roll	72	0	72
Bandage, muslin, 37" x 37" x 52" Trian. pkg.	6	1	5
Cotton, purified, 1 lb. pkg.	3	1/2	2 1/2
Pads, gauze, 4" x 4"	1,200	191	1,009
Applicator, wood, cotton tipped end	600	32	568
Depressor, tongue, wood	300	139	161
Forceps, splinter, tweezer, 3 1/2 in.	1	1	-
Pin, safety, 1 1/2 in.	144	18	126
Scissors, blunt, 4 in.	3	2	1
Syringe, fountain, plastic	1	-	1
Thermometer, oral	4	2	2
<u>Medical Care in Shelters</u>	1	1	-
Contents List	1	1	-

<sup>a</sup>Does not include items brought by physicians in their medical bags.

Table 28

Food and Water Consumption<sup>a</sup>  
 (ES VII)

Item	Total Consumed	Consumed/ person/day
Crackers	483 lbs.	0.26 lbs.
Carbohydrate	235.25 lbs.	0.13 lbs.
water	2183.20 qts.	1.18 qts.

<sup>a</sup>Ss were allowed to bring additional supplies.

Table 29

OCD Shelter Provisions  
(ES VII)

Item <sup>a</sup>	Stocked	Used	Unused
Crackers, tin (7 lbs./tin; 6 tin/box; 43 boxes)	258	69	189.0
Carbohydrate, tin (35 lbs./tin; 2 tin/box; 9 boxes)	18	6.75	11.25
Water Drum (17 1/2 gal.; 148 1/2 lb. each)	60	32.5	27.5
Sanitation Kit IV:			
Toilet tissue	60	42	18
Drum, fiber	6	4	2
Seat, commode	6	5	1
Can opener	6	5	1
Sanitary napkins	360	204	156
Gloves, polyethylene, pr.	6	6	0
Spout	6	6	0
Tie wire	6	6	0
Cups	420	420	0
Cup lids	420	420	0
Commode chemical	6	4	2
Bag, polyethylene	6	4	2
Instruction sheet	6	5	1
Radiological Kit <sup>b</sup>	1	1	-
Additional Supplies <sup>b</sup>			
<u>Shelter Handbook</u>	1	1	-
<u>Guide to Shelter Living and Training</u>	1	1	-
Fire extinguishers	4	0	4
Hassock fan	1	1	-
Bible	1	1	-

<sup>a</sup>Excludes Medical Kit items.<sup>b</sup>Non-expendable items.

## Chapter 12 - Experimental Design (ES VIII)

ES VIII, the third 300-person shelter occupancy test, was conducted 10-12 September, 1965. This weekend study was structured according to the following experimental design, based on analyses of ES VII results.

### I. Shelter Management

#### A. Pre-Shelter Orientation

One purpose was to evaluate the effects of a ten-minute pre-shelter orientation address on the sheltrees, in an attempt to motivate assumption of the responsibility of self-government. This short talk covered the following points:

1. Emergency self-management by the sheltrees with untrained staff leadership.
2. The presence of a handbook with other shelter supplies to describe shelter operation.
3. Jobs for almost all adults.
4. A caution to follow instructions to the letter with no omission or unnecessary deviation.

#### B. Handbook Revision

The revised Shelter Handbook was to be tested, and assessment of old and new variables continued, such as:

1. The initiation of a three-person Shelter Manager triumvirate in the temporary phase.
2. A re-writing of the Radiological Monitor's instructions for the temporary phase.
3. The SM Staff Structure of ES VII.
4. The temporary, transition, and permanent Handbook phases.
5. In-shelter activity and training programs.

#### C. Emergency Operating Center

For the first time, an EOC format was programmed into the shelter routine for purposes of evaluating EOC problems and shelter liaison.

## II. Shelter Environment and Supplies

In this area, it was intended to:

- A. Continue study of problems related to use of a multi-chambered shelter, e.g., space utilization and shelter population distribution.
- B. Continue study of effects of shelter ventilation and temperature on management, and on sheltrees.
- C. Continue evaluation of supplies that sheltrees bring into the shelter.
- D. Continue evaluation of OCD stocks.
- E. Continue study of sanitation problems, e.g., commode use, food and water supply use, and general cleanliness.
- F. In accordance with previous study recommendations, initiate evaluation of added sanitation supplies: ratio of 1 mop, 1 broom, and 1 lb. rags/75 sheltrees. Total for 300 sheltrees: 4 mops, 4 brooms, 4 lbs. rags.

## III. Sheltree Characteristics

The study of the use of lower age limits continued, preliminary to planning future infant studies.

## IV. Experimental Aspects

In addition to variables already listed, ES VIII was to:

- A. Further evaluate the "shadow" technique of observation of SM staff management.
- B. Initiate an in-shelter CDR observer watch schedule.
- C. Continue evaluation of outside instrumentation watch schedule.
- D. Continue evaluation of procedures for handling defections in large occupancy groups.
- E. Further develop sheltree reaction evaluation techniques, e.g., diaries and questionnaires.
- F. Further study pre- and post-shelter processing procedures.
- G. Evaluate emergent leadership predictors.

## Chapter 13 - Shelter Handbook Changes

### I. Handbook Revision

The Shelter Handbook, revised on the basis of ES VII observations, was forwarded to OCD as the July-September 1965, Quarterly Report. An overview of some of the major changes in the revision follows. However, to gain a realization and comprehension of the changes in the original version, it is necessary to read in entirety the revised Handbook.

#### A. General Revision

Some instructions in the temporary phase of the Handbook were rewritten to enhance clarity and brevity. Things considered non-essential for survival were deleted, on the premise that shelterees under great stress would be able to absorb only basic instructions. Many of the instructions have been shortened to fit on one page.

On the basis of data and observations obtained from ES VII, there were several important additions to the temporary phase.

One important experimental variable was a brief orientation talk given prior to shelter entry in ES VIII. The shelterees were told they would manage the shelter themselves, that a handbook would be found in the shelter with task descriptions, and that they were to follow the instructions carefully.

Other experimental variables involved the Handbook format. For example, the first three adults entering the shelter were to find the Handbook and distribute job leaflets. Furthermore, the temporary Shelter Managers were instructed to give job leaflets only to people who can read. Also, certain directions basic to survival have been capitalized, underlined, or preceded by the phrase, "Important for Survival." The previous job requirement for most tasks in the temporary phase, viz., that "male" rather than "female" adults be selected, was eliminated.

#### B. Specific Changes

##### 1. Entry Phase Procedures

Following are the revised Temporary Staff Structure (Figure 9) and the Temporary Staff Task Leaflet Distribution Sequence (Table 30) used in ES VIII.

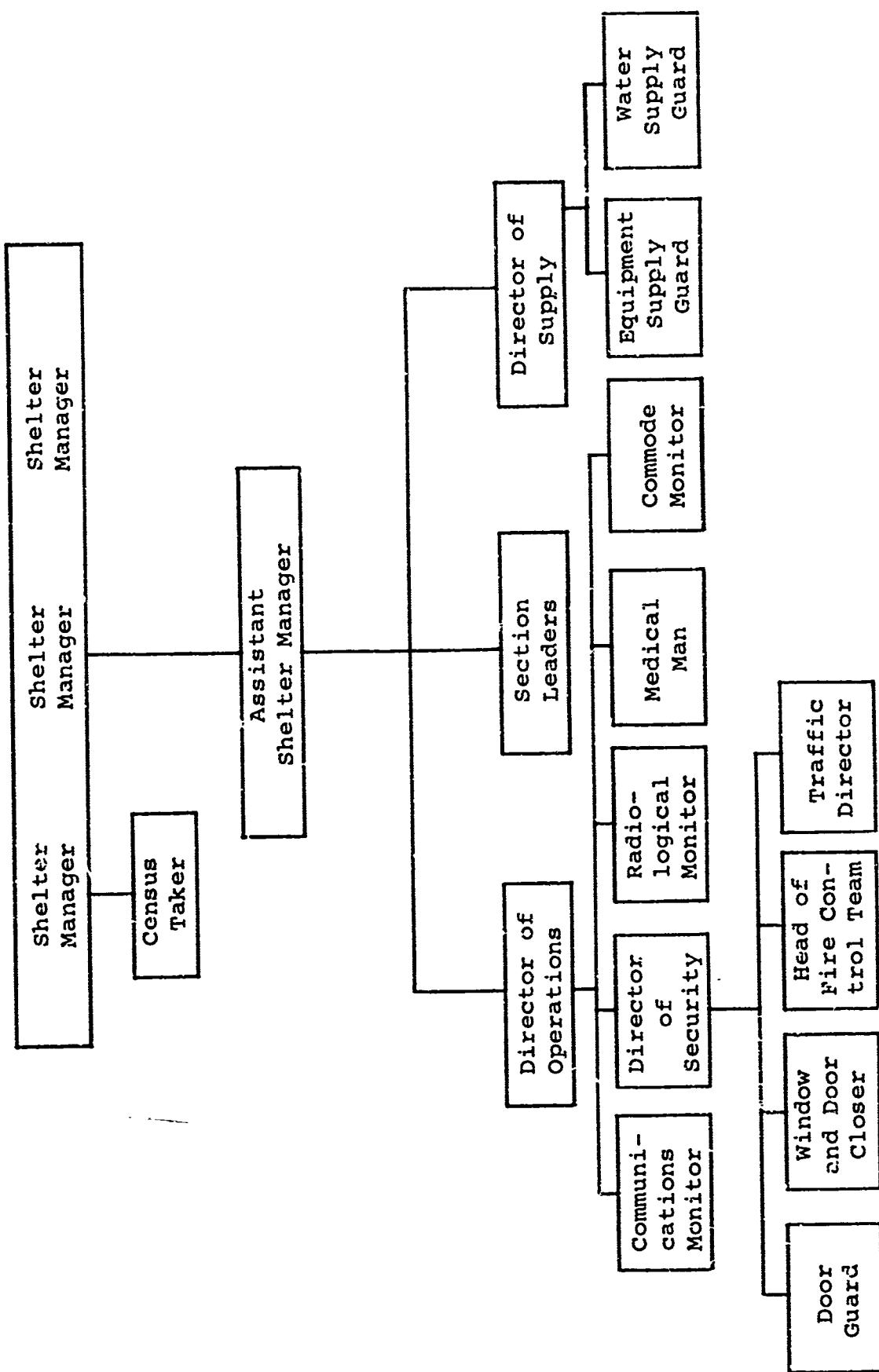


Figure 9. Temporary Staff Structure (ES VIII).

Table 30

Temporary Staff Task Leaflet Distribution Sequence  
(ES VIII)

Sequence	Staff Position
1	Handbook picked up by first three adults entering the Shelter (TSMs).
2	Assistant Shelter Manager
3	Census Taker
4	Door Guard - Main Door
5	Traffic Director - Main Door Section Leaders (4)
6	Door Guard - Secondary Entrance
7	Traffic Director - Secondary Entrance Section Leaders (4)
8	Door Guard - Secondary Entrance
9	Traffic Director - Secondary Entrance Section Leaders (4)
10	Window and Door Closer
11	Water Supply Guard
12	Equipment Supply Guard
13	Head of Fire Control Team
14	Director of Operations Commode Monitors
15	Medical Man
16	Radiological Monitor
17	Communications Man
18	Director of Supply
19	Director of Security
20	Shelter Managers

## 2. Temporary Staff Positions

### a. Temporary Assistant Shelter Manager

The order and format of presentation of duties were revised.

### b. Temporary Census Taker

Census Taker's Tally Sheet format was changed and structured more.

### c. Section Leaders

Examples were included in the Shelteree Information sheet. An introductory talk was added to the SLs' instructions, to assist in communicating vital basic directions to the shelterees.

### d. Temporary Head of Fire Control Team

The order of tasks was changed so that those of most importance were given priority in sequence. Also, some of the instructions in checking out fire extinguishers were changed to prevent the possibility of inadvertently starting an extinguisher.

### e. Temporary Director of Operations

The TDO was given supervision of more positions, viz., the Director of Security and Medical Man, in addition to Radiological Monitor and Communications Man, and Commodo Monitors. Duties for all of these positions were listed on the TDO's instruction sheet.

### f. Temporary Radiological Monitor

Major changes in the instructions for this temporary position were written by a trained Radiological Monitor to meet the needs of an untrained person in assembling, checking, and using radiological monitoring equipment without having to read the Radef handbook immediately.

Past studies have shown that an untrained person cannot effectively use the Handbook for Radiological Monitors as a guide for monitoring operations during the initial shelter entry period. A brief set of instructions was written in an attempt to meet the needs of an untrained person in operationally checking and using monitoring equipment without having to read the Handbook for Radiological Monitors. These

instructions are concerned only with initial operations allowing an untrained person to read meters and monitor, while avoiding most of the technical language in the Handbook for Radiological Monitors.

g. Temporary Shelter Managers: The Triumvirate

In ES VII the temporary Shelter Manager did not function effectively; a great deal of his troubles undoubtedly stemmed from the fact that he was looking into a movie camera while he was trying to follow the Handbook instructions. However, several other shelterees attempted to help the TSM. This observation suggested that at least on an experimental basis, more than one person could be designated as a temporary Shelter Manager from the start. The use of multiple TSMs would allow these people to consult with each other on necessary decisions, and would increase the probability that at least one of these people would emerge a competent leader. All three of the TSMs in ES VIII had identical duties.

3. Transition Phase

The entire section was shortened and reworded for brevity and clarity.

4. Permanent Phase

a. Instruction Format

In general, major revisions were made in the format of the permanent phase instructions. All duties for each position were divided into three sections:

- (1) Those to be done immediately
- (2) Those to be done daily
- (3) General duties

This format was adopted to help staff members refer to tasks quickly and efficiently.

b. Staff Functions

(1) Food and Sanitation Procedures

New instructions stressed food sanitation. The procedure of the moving-point shelter-wide feeding was deleted from the DO's instructions, and food rationing tables were added. Security regulations concerning food were given additional emphasis.

(2) Administrative Clerk's Records

A structured Section Radiation Dose Record and an Individual Radiation Dose Record were added.

(3) Director of Operations' Instructions

Major changes were incorporated in methods of calculating daily rations of food and water. While the number of pages in this section remained about the same, more space was devoted to tables and less to text.

(4) Radiological Monitor's Records

Examples were included on the Communication Monitor's Log and the Radiological Monitor's Log.

(5) Section Leaders' Instructions

A Section Leader's check list was provided to prevent shelterees from going through food lines more than once. Also, food and water security within the section was emphasized. Daily section clean-up periods were added to provide better sanitation at the section level.

## II. Shadow Staff Procedures

Procedures similar to those discussed for ES VII were followed in ES VIII in the selection and training of the shadow staff. The resultant personnel are presented in Table 31. All possessed college degrees. As in ES VII, shadow staff members were acquainted with the Civil Defense Shelter Program, CDR research studies, the Shelter Handbook, shadow evaluation procedure, and shadow techniques. A seven-hour training session was used for formal training, and each shadow staff member was given a copy of the Handbook to study prior to the shelter study.

Table 31

**Shadow Staff Characteristics  
(ES VIII)**

Shadow Staff Position	Age	Background	OCD Training
Shelter Managers	25	Lawyer	Shelter Manager Course
Assistant Shelter Manager	25	Graduate Student	None
Director of Operations	31	Navy Officer	None
Director of Supply and Maintenance	30	Navy Officer	None
Director of Radiological Monitoring	34	Ph.D. in Mathematics, Teacher	Radiol. Monitor Course
Director of Training	46	Retired Army Officer	None
Director of Activities	31	Housewife	None
Section Leader (1)	28	Graduate Student	Tangent CD in Army Reserve
	(2)	24 Graduate Student	None
	(3)	28 Teacher	None
			(Contd.)

Table 31 (Contd.)

Shadow Staff Position	Age	Background	OCD Training
(4)	23	Graduate Student	None
(5)	25	Navy Officer	None
(6)	24	Graduate Student	None
(7)	27	Graduate Student	None
(8)	22		Radiol. Monitor Course
(9)	25	Navy Officer	None
(10)	27	Graduate Student	None
(11)	23	Navy Officer	None
(12)	30	Graduate Student	None

## Chapter 14 - Publicity and Recruitment

### I. Publicity

Prior to the ES VIII weekend study, a news release was distributed to all news media within a nineteen-county area of Athens, Georgia. The "Door to Survival" folder was revised to explain the purposes of ES VIII and distributed to groups in the defined recruitment area.

Two towns were selected to send volunteer community groups to ES VIII, namely, Forest Park, Georgia, 83 miles from Athens, and Monroe, Georgia, 24 miles from Athens. Representatives from Civil Defense Research conducted all-day recruiting in both towns and addressed the groups on the evening of their visit. Stories appeared in the local papers in connection with these scheduled events.

The fact sheet used in ES VII, with appropriate changes, was utilized again in ES VIII. The fact sheet gave the background and purpose of the research, the current test conditions, the test objectives, and the health precautions. As in ES VII, it was to be used only if requested, and was, since news representatives did inquire about the experiment. Stories appeared in the two Athens' papers and on the three Athens' radio stations.

Eight Civil Defense Directors in the area were invited to visit Experimental Study VIII.

### II. Recruitment

Letters and return post cards were sent to 583 applicants already on file in order to determine availability for ES VIII and to offer members of an applicant's family an opportunity to apply.

Three hundred and twenty-one persons were selected to comprise the ES VIII shelter population. This group consisted of men, women, and children with an age range of 1-67 years. The 19 shadow staff members numbered among the 321 sheltterees. As in the previous study, shadow staff members performed as observers and were not permitted to accept temporary or permanent shelter task assignments. Also counted among the 321 sheltterees were one of two doctors and one of three registered nurses, working as two-person medical teams on eight-hour shifts around the clock.

Seventy-nine per cent of the shelteree group was composed of family units, and 21% were individuals without other family members. For a comparison of the ES VIII group with the 1960 Census see Table 32.

Of the total shelter population, 73% of the sheltterees were applicants already on file, 16% were from Forest Park, Georgia, and 11%

Table 32

**Shelteree Characteristics  
(ES VIII)**

Item	U. S. Census (1960)	ES VIII
Number of Shelterees		321
Age Range		1-67 years
Average Age	29.5 years (Median)	17 years (Median) 22.4 years (Mean)
Average Education	10.6 years (Median)	12 years (Median) <sup>a</sup> 11.5 years (Mean) <sup>a</sup>
Sex	49.3% Males 50.7% Females	46.2% Males 53.8% Females
Race	88.57% White 10.53% Negro 0.90% other	86.34% White 12.10% Negro 1.56% other

<sup>a</sup>Shadow staff not included.

were from Monroe, Georgia. Shelters from Forest Park and Monroe were recruited as groups, respectively. Recruited shelters submitted a medical history questionnaire for evaluation prior to selection for the study. On the day of shelter entry all shelters filled out Medical Inquiry forms to determine current state of health. Medical examinations were given at this time to (a) anyone who listed a current ailment which might adversely affect that person or others as a consequence of confinement, and (b) all shelters 50 years of age and older.

### III. Resultant Shelter Populations

The pre-study news releases, the "Door to Survival" folder, the availability post cards, and speeches given by CDR representatives provided the necessary publicity that enabled the staff to recruit a total pool of 1,402 shelters. A total of 628 was used in the two experiments (307 in ES VII and 321 in ES VIII), leaving a file of 774 current applications. (This 774 figure is misleading because a large number of applicants are concentrated in the teen-age level, and only a certain number could be used in approximating the 1960 U. S. Census.)

It is evident that recruitment demands continual expansion because (a) studies use large numbers of shelters, (b) it is not advisable to use shelters twice, (c) University-associated personnel are precluded by University budgetary policy, and (d) applicants have to pass a medical history screening.

It should also be noticed that in ES VII the age of participants was lowered to two years; and in ES VIII to one year.

The two studies compared favorably in age, education, and sex. For a comparison of ES VII and ES VIII shelter characteristics, see Table 33.

Table 33  
Comparison of Shelteree Characteristics--ES VII and ES VIII

Item	U. S. Census (1960)	ES VII	ES VIII
Number of Shelterees	307	321	
Age Range	2-67 years	1-67 years	
Average Age	29.5 years (Median) 20.3 years (Mean)	15 years (Median) 22.4 years (Mean)	17 years (Median) 22.4 years (Mean)
Average Education	10.6 years (Median)	11 years (Median) <sup>a</sup> 11.7 years (Mean) <sup>a</sup>	12 years (Median) <sup>a</sup> 11.5 years (Mean) <sup>a</sup>
Sex	49.3% Males 50.7% Females	45.3% Males 54.7% Females	46.2% Males 53.8% Females
Race	88.57% White 10.53% Negro 0.90% other	100% White	86.34% White 12.10% Negro 1.56% other

<sup>a</sup>Shadow staff not included.

## Chapter 15 - Pre- and Post-Shelter Processing Procedures

### I. Pre-Shelter Processing Procedures

Woodruff Hall, located on the University of Georgia campus, served as the processing area for ES VIII. Processing, which lasted from 1:00 P.M.-4:00 P.M., Friday, 10 September, 1965, included the following phases:

#### A. Roster Check

The name of each shelteree, as he entered the building, was checked against a previously prepared list. Three-hundred twenty-one sheltrees were processed for shelter entry.

#### B. Medical Inquiry

A medical inquiry was completed by each shelteree to detect any current physical ailment which might have adversely affected the subject or others as a result of confinement, e.g., a cold, sore throat, earache, asthma, toothache. Individuals having such conditions were referred to one of two standby physicians, who determined whether or not the individual should be allowed in the shelter. All persons 50 years of age and older were required to take a physical examination by one of the standby physicians. No sheltrees were rejected by the physicians for being too sick to enter the shelter.

#### C. Testing

All sheltrees completed a Possession Inquiry Form, on which they listed items taken into the shelter. Persons 15 years of age and older were then given a series of tests, during which time children 14 years of age and under viewed movies.

The following tests were given.

1. The Leadership Sub-Scale of the MMPI: Used as an experimental predictor of later emergent leadership patterns.
2. The Orientation Inventory: Also used to probe leadership patterns in the group.
3. Pre-Shelter Questionnaire: Given in two forms and designed to obtain socio-economic data.

When testing was completed, the sheltrees were reassembled as one group.

D. Project Director's Address

The Project Director spoke briefly to the group at the termination of their pre-shelter processing. He congratulated them on their patriotic participation and reminded them of the importance of this experiment in terms of national Civil Defense. He then instructed the group that they must manage the shelter themselves, and that the success or failure of group organization was their responsibility.

E. Entrance into shelter

The sheltrees were then transported by bus to the shelter.

II. Post-Shelter Processing Procedures

Post-shelter processing procedures were conducted in the same manner as for ES VII.

## Chapter 16 - The 300-Person Shelter Facility

The design, construction, and use of the 300-person shelter in ES VIII were the same as in ES VII (see Figure 1) except for the following changes:

1. Equipment for the Emergency Operating Center included a table, phone, and bell inside the shelter and in the control room for two-way communication.
2. An outside observer stationed at a one-way mirror narrated a tape recording of events in the entry phase.
3. All camera ports used in ES VII were covered, leaving only one-way mirrors at these ports.
4. All cardboard covering outside windows in ES VII was removed for ES VIII to permit natural lighting.
5. The frosted night lights used in ES VII were replaced by red, 15-watt night lights in ES VIII to reduce the level of night-time illumination.
6. Sanitation Kit drums and water drums were used as the only commodes in ES VIII.
7. In ES VII, USAERDL sanitary vaults were used in three of the four Commode Areas, with the SK IV chemical commodes being used in the fourth Commode Area. For experimental purposes, these vaults were installed prior to the actual study. Thus, the use of at least one of the Commode Areas on the second floor and both of those on the first was predetermined and not left up to shelteree staff decisions. In ES VIII, all writing and instructions used in ES VII were removed from the Commode Areas to preclude suggestions on the utilization of these spaces, although it would seem obvious that a specially built wooden structure (on the first floor) was intended for this purpose. Apparently, therefore, the shelterees in ES VIII considered the first floor Commode Area as adequate, and used the second floor rooms for sleeping areas.
8. The THI meters used in ES VII were not used in ES VIII, because response to changes in temperature was too slow compared to the other temperature recording devices (thermistors and power psychrometer). Temperature readings from thermistors placed at a height of three inches in Rooms C and D were not recorded in ES VIII because of the high correlation between these thermistors and the thermistors placed at a height of seven feet.
9. Four mops, four brooms, and four pounds of rags were added to the supplies in the shelter in ES VIII.

The concept of an Emergency Operating Center (EOC) as a communications link between shelters needs to be investigated in detail during actual shelter occupancy studies. Shelter occupancy studies employing naive subjects can provide the most realistic experimental approach to some of the problems involving EOCs.

In ES VIII, a simple EOC program was initiated. This program consisted of a sequence of telephone messages along with a sequence of radiological inputs, which required coordination among various shelter staff members to solve the problems or provide answers to the questions. The telephone messages were designed to obtain information which would be needed by an EOC in case of an actual emergency and to test further certain aspects of the Handbook.

The equipment used for the EOC messages consisted of two telephones, one in the shelter, and one in the control room to serve as the EOC phone. The phone in the shelter rang like an ordinary phone; however, the Communications Man only needed to lift the receiver (rather than dial) to call EOC. The EOC message program, including the radiological inputs, is given in Appendix F.

I. Medical Coverage on Day of Entry

Following the procedures of ES VII, a medical form was completed for each shelteree. Anyone with a medical condition of such nature to endanger other people during the shelter stay, or be complicated by the shelter stay was referred to a physician for further evaluation, and designated a non-routine referral. Shelterees 50 years of age or older were routinely referred to a physician for a check-up. There were only 11 such routine referrals, although seven others were referred for non-routine reasons (Table 34).

Colds accounted for most (11) of the non-routine referrals (see Table 34). Females had the most referrals with 24 non-routine referrals as contrasted with 21 such cases for the males. The 11- to 19-year-old age group had the most non-routine referrals (18). Table 34 reveals the wide range of medical disorders that appeared in the final stages of pre-shelter processing. In spite of these disorders, none of the potential shelterees was rejected as being medically unfit for shelter confinement.

II. Pre-Shelter Questionnaire

The following observations covering the behavior patterns of Ss in ES VIII were drawn from Pre-Shelter Questionnaire responses. Detailed data may be found in Appendix A.

Since none of the ES VIII deflections were psychological, no attempt was made to use Pre-Shelter Questionnaire information in a predictive manner.

For single Ss (N=31), the following observations were made:

- A. "Movies" had the highest frequency listing as a favorite pastime. "Clubs" ranked second.
- B. "One year" and "years" were listed most often as the length of time of group membership.
- C. Seventy-five per cent of the single Ss earned \$500.00 or less in 1964. Slightly more than one-third earned less than \$100.00.
- D. When asked how long they watch TV, single persons listed from two to three hours per day.

Table 34

Reasons for Medical Referral on Day of Entry  
(ES VIII)

Reason	Sex	Age						N=2
		0-10 N=9	11-19 N=18	20-29 N=4	30-39 N=4	40-49 N=3	50-59 N=16	
Routine	Male	0	0	0	0	0	<u>3</u> <sup>a</sup> <u>7</u>	0
	Female	0	0	0	0	0	0	1
Colds	Male	<u>1</u>	<u>1</u>	0	0	<u>1</u> <u>0</u>	0	0
	Female	<u>2</u>	<u>5</u>	0	<u>1</u>	0	0	0
Earache	Male	<u>1</u>	<u>1</u>	0	0	0	0	0
	Female	<u>2</u>	<u>0</u>	0	0	0	0	0
URI	Male	<u>1</u>	<u>2</u>	<u>1</u> <u>0</u>	0	0	0	0
	Female	0	<u>0</u>	0	0	0	0	0
Asthma	Male	0	<u>1</u>	0	0	0	0	0
	Female	0	<u>0</u>	0	<u>2</u>	0	<u>1</u>	0
Hayfever	Male	0	0	<u>2</u> <u>0</u>	0	0	0	0
	Female	0	0	0	0	0	0	0
Diarrhea	Male	0	0	<u>1</u> <u>0</u>	0	0	0	0
	Female	0	0	0	0	<u>1</u>	0	0
Allergy	Male	0	0	0	0	0	0	0
	Female	<u>1</u>	0	0	<u>1</u>	0	0	0
Gout	Male	0	0	0	0	0	<u>1</u> <u>0</u>	0
	Female	0	0	0	0	0	0	0
Bronchitis	Male	0	0	0	0	0	0	0
	Female	0	<u>1</u>	0	0	0	0	0
Dizzy Spells	Male	0	0	0	0	0	0	0
	Female	0	<u>1</u>	0	0	0	0	0
Sprained Ankle	Male	0	<u>1</u> <u>0</u>	0	0	0	0	0
	Female	0	0	0	0	0	0	0

(Contd.)

Table 34 (Contd.)

Reason	Sex	Age						
		0-10 N=9	11-19 N=18	20-29 N=4	30-39 N=4	40-49 N=3	50-59 N=16	60 + N=2
Ring Worm	Male	0	0	0	0	0	0	0
	Female	0	<u>1</u>	0	0	0	0	0
Impetigo	Male	0	0	0	0	0	0	0
	Female	0	<u>1</u>	0	0	0	0	0
Bells Palsy	Male	0	0	0	0	0	0	0
	Female	0	0	0	0	0	<u>1</u>	0
Anemia	Male	0	0	0	0	0	0	0
	Female	0	0	0	0	<u>1</u>	0	0
Pulled Cartilage	Male	0	<u>1</u>	0	0	0	0	0
	Female	0	<u>0</u>	0	0	0	0	0
Infection	Male	0	0	0	0	0	0	0
	Female	0	<u>1</u>	0	0	0	0	0
Emphysema	Male	0	0	0	0	0	<u>1</u>	0
	Female	0	0	0	0	0	<u>0</u>	0
Seizures	Male	0	0	0	0	0	0	0
	Female	0	<u>1</u>	0	0	0	0	0
Poison Ivy	Male	<u>1</u>	0	0	0	0	0	0
	Female	0	0	0	0	0	0	0
Cardiovascular Problems	Male	0	0	0	0	0	0	<u>1</u>
	Female	0	0	0	0	0	0	<u>0</u>
High Blood Pressure	Male	0	0	0	0	0	<u>1</u>	0
	Female	0	0	0	0	0	<u>0</u>	0
Nervousness	Male	0	0	0	0	0	<u>1</u>	0
	Female	0	0	0	0	0	<u>0</u>	0

\*All frequency counts are underlined.

For married Ss (N=50), the following observations were made:

- A. Over 50% stated they owned their homes.
- B. Over 80% had never been divorced.
- C. Family problems receiving the highest ranking were "death of a family member," followed by "medical operation" in second place.
- D. Annual income fell predominately in the \$2500-\$5000 bracket. However, more than 25% listed \$2500 or less. Slightly less than 25% were earning more than \$5000 but less than \$7500 per year.
- E. The majority of married sheltterees watch TV not more than one hour per day.
- F. Both single and married Ss listed "church" as the group outside the home in which they were most interested.

### III. Civil Defense Information

Prior to shelter entry, 81 sheltterees over 14 years of age completed a Civil Defense Information Questionnaire. Again, it was found that the majority of sheltterees were not adequately prepared for emergencies.

- A. Question I: Do you have a family fallout shelter?

Responses of 31 single sheltterees indicated that 3% had family shelters, whereas 2% of 49 married sheltterees had family shelters. Of the total responses (80), 3% affirmed the existence of family fallout shelters.

- B. Question II: Have you gone to Civil Defense classes?

Of the 31 single sheltterees who answered this item, none indicated that they had attended CD classes; however, in the married category 11% of the 47 indicated that they had attended CD classes, giving a 6% affirmative of the total 78 responses.

- C. Question III: Do you know where there is a community fallout shelter for you and your family?

Fifty-three per cent of the 30 single sheltterees' responses and 48% of the 46 married sheltterees' responses, combining to give 50% of the total, indicated a knowledge of family shelter locations.

- D. Question IV: Do you have emergency supplies of food and water in your home?

The 28 responses from the single shelteree category yielded 14% affirmative answers, while in the married category 32% of the 47 responses were affirmative as were 25% of the combined total of 75 answers.

E. Question V: Do you have emergency supplies of medicine and first aid equipment in your home?

Of the single shelterees' 30 responses, 60% were in the affirmative, but only 29% of the 49 married responses indicated home emergency supplies of medicine and first aid equipment. The affirmative responses for the two groups combined (79) totaled 41%.

IV. MMPI Leadership Subscales

Eighty-two of the 321 shelterees were selected as a sample to take the MMPI Leadership Subscales. Included in this group of 82 were 16 of the 20 shelterees who later became temporary shelteree staff member and 8 of the 19 who subsequently were chosen to be permanent shelteree staff members. The reasons that all of the staff members were not found to be in the tested group were (a) prior to the study it could not be determined who would be members of the shelteree staff, and (b) for reasons of time, approximately one-half of the adult shelter population was given this MMPI test.

Of the 16 tested members of the temporary shelteree staff, 56% of them fell into the top 25% of the 82 tested. Seventy-five per cent of the 16 temporary staff fall into the top 50% of the group tested, and only one staff member fell into the lowest 25%. Included in the top 25% were one of the temporary Shelter Managers, the temporary Assistant Shelter Manager, temporary Director of Supply, Head of the Fire Control Team, and four of the seven temporary Section Leaders who took the test.

Of the eight tested members of the permanent shelteree staff, 62% fell into the top 25% of the 82 shelterees tested. As in the case of the temporary staff, 75% fell into the upper 50% of those tested, and only one staff member fell into the lowest 25%. The permanent Shelter Manager and Assistant Shelter Manager were not tested; but the Director of Supply and Maintenance and four of the five Section Leaders tested were in the top 25%.

V. Possession Inquiry Form

Information derived from the Possession Inquiry form is divided into two rank-order categories. The number of persons bringing specific items into the shelter is differentiated from the list denoting the frequency with which specific items have been brought. A sample of 269 was taken from the shelteree population of 321. This sample was largely

determined by pre-shelter processing procedures in which all persons under 15 years of age watched movies while the rest filled out the inquiry forms.

Candy was the most frequent item listed as being brought into the shelter with 49.4% bringing this item. Bedding items ranked second with 45% bringing blankets, 41.3% bringing pillows, 25.7% bringing sleeping bags, and 20.4% bringing air mattresses. Books were ranked third in the frequency list with 44.2% of the sample bringing books. Gum was a food item which had a high ranking both in the number of persons bringing gum and in the total amount brought. Forty-three percent brought gum with a frequency which ranked third.

Certain types of clothing were listed by a large percentage of the sample: underwear, 35.7%; jacket (coat/sweater), 28.6%; shirt/blouse, 18.2%; socks/stockings, 17.1%; pants/slacks, 12.6%; change of clothes, 11.2%.

Food items ranked highest by number of persons bringing the items were candy, gum, cookies, 23.4%; fruit, 21.2%; and cans of food, 20.4%. Certain toilet articles--such as tissues, 56.5%; toothbrush, 38.7%; deodorant, 28.3%; toothpaste, 24.5%; cosmetics, 23.4%; mirror, 21.2%; and wash cloths, 24.5%--were listed frequently.

Cards were the most frequently listed recreational item, being brought by 29.7% of the sample. Headache preparations were brought by 32.3% of the sample, a percentage higher than any other listed medicine or individual prescription.

Essential items such as bedding, certain types of clothing, certain kinds of food, games, and medicines all had an expected high percentage. Items brought in by only one person, thus having the lowest percentage, could be classified as "nonessentials." Such cases are illustrated by the following items: head scarf, rain hat, boiled eggs, tea, sugar, bologna, thermometer, baby medication, and ear drops.

The 14 items having the highest listed frequency were: candy, 126.0%; books, 83%; gum, 78%; wet-dry towelettes, 73.6%; pen/pencils, 63.9%; cookies, 63.2%; tissues, 56.5%; cans of food, 56.1%; blanket, 50.2%; fruit, 48.3%; underwear, 47.2%; pillow, 43.9%; toothbrush, 39%; and cigarettes, 37.2%.

The following ten items were listed as brought into the shelter by the most people: candy, 49.4%; blanket, 45.0%; books, 44.2%; gum, 43.1%; pillow, 41.3%; toothbrush, 38.7%; pen/pencils, 36.4%; underwear, 35.7%; watch, 30.5%; and cards, 29.7%. (Further detailed data on personal possessions may be found in Appendix E.)

## I. Shelteree Staff Organization

Shelter entry began at 4:22 P.M. The first three women into the shelter read the instructions on the Handbook. Only one of these women accepted any responsibilities; she functioned as a single TSM. The triumvirate did not materialize as a functioning unit. The first male to enter became the temporary Assistant Shelter Manager (TASM). He emerged as the spokesman for the TSM at her request. She functioned only twice in the temporary phase, handing out instruction leaflets and aiding in selection of the permanent staff. Although the TASM refused the TSM's offer to accept her job, he functioned as though he had.

The temporary Traffic Director's (TTD) leaflet was given to a fourth woman who took the leaflet and read it but made no attempt to form sections and appoint temporary Section Leaders (TSL). As a result most shelterees congregated in the main room near the entrance. After all the leaflets were distributed (about 17 minutes after entry), order came slowly. While trying to keep the crowd quiet, the TASM assumed command and set up a staff. Thus he performed duties intended for the TSM such as (1) making announcements to the shelterees, (2) coordinating the shelteree staff, and (3) making decisions. He used the Handbook as a guide, but for the most part made decisions on his own.

The major problem encountered during the entry phase was the failure of several people to carry out their prescribed duties. For instance, the failure of the TTD to form sections, appoint TSLs, and keep shelterees away from the entrance, caused the census to be incorrect, and forced the TASM to assign additional SLs.

There was also some confusion surrounding the temporary Communications Man. The person who initially received the instruction leaflet for this position did not assume the responsibility. The woman who first answered the EOC telephone fulfilled the function, and therefore served as the Communications Man.

Other areas of confusion seemed to center around the temporary Water Supply Guard and temporary Equipment Supply Guard positions. Twenty minutes after all the leaflets had been passed out there was still no functioning temporary Water Supply Guard and the temporary Equipment Supply Guard had left the equipment area to look for the Director of Supply.

In contrast to the ineffectiveness of these few positions was the ability and initiative shown by the TASM. Although he was at first reluctant to accept the position of TASM, he realized it was necessary to begin operations immediately. While the TSM was passing out Handbook leaflets, the TASM began to organize the entry phase and coordinate

the staff. After the first call from EOC, he appointed a TCM to fill in for the person who had been assigned during entry, but who was not functioning. He also appointed additional temporary Equipment Supply Guards when he saw that these members of the staff were not staying with the supplies.

Due to the initial confusion surrounding the TTD, the sections were oversized, averaging 42 sheltrees per section as contrasted with the 25-30 suggested in the Handbook. When operations began to run more smoothly, the TASM reorganized the sections to form more workable groups, averaging approximately 33 sheltrees per section.

Once set up, the temporary management staff worked smoothly and began preparations for starting the permanent phase. Although holders of several positions were not functioning as desired, the leadership ability and initiative of the TASM were sufficient to overcome these problems.

The suggested procedure for choosing the permanent staff was contained in the Handbook.

The transition from temporary to permanent phase was completed approximately 3 1/2 hours after entry. The new staff were well chosen, in accordance with the criteria outlined in the Handbook. Outstanding examples of careful selection were: (1) the selection of a fireman as Head of the Fire Control Team, (?) the selection of experienced teachers to fill the positions of Director of Training and head of the nursery, and (3) the retention of many of the TSIs.

An exception was the placement of the qualified TASM in the permanent staff position of Section Leader. The TASM later reported that he did not accept a major position because he had the responsibility of caring for his family. Also, he felt there were other qualified persons available to fill top management jobs.

The permanent staff assumed command easily and without incident. They followed the Handbook closely for the most part. The main differences in the suggested and actual staff structure were the slightly enlarged sections (33 per section rather than the suggested 25-30), and a combining of two staff positions under one man. These two positions, Director of Radiological Monitoring and Communications (DRMC) and Head of the Fire Control Team, are not time-consuming under experimental conditions. Another variation in the suggested structure was the lack of a functional advisory council, possibly considered as unnecessary for the short shelter stay.

The permanent staff followed the Handbook more closely than did the temporary staff. The former had the advantage of inheriting a comparatively orderly shelter program already in progress, and thus there was more time to refer to the Handbook for guidance. Also, many

of the instructions in the temporary phase could not be carried out under the particular experimental design of ES VIII. For example, there were no windows for the Window and Door Closer to close, there was no way to fill empty water drums, etc. This partially accounts for low task completion scores for some members of the temporary staff.

Data were collected concerning the age, sex, occupation, education, and number of family members in the shelter for the principal members of both the temporary and permanent shelteree staff (Tables 35 and 36). A strict comparison of the characteristics of the two groups would not be valid, since the positions given are not exactly the same, and the methods of selection were quite different. The permanent staff mean age was approximately 6 years less than that of the temporary staff ( $P=.06$ ). A similar differentiation was observed in the educational characteristics of the two staffs ( $P=.08$ ).

The characteristics of the permanent staff were also compared with the entire shelter population. The mean educational level for the management staff was approximately 3 years higher than the adult shelter population.

With the exception of the Administrative Clerk, all members of the permanent staff were free of the responsibility of caring for children.

Staff members were not chosen with number of children as a selection factor. However, information from various data forms indicates that number of children was a factor considered by permanent staff members before they accepted their positions. In other words, those shelterees with children in the shelter felt their first duty was to their families. The t-test indicated the mean difference in number of children between the ES VIII temporary and permanent shelteree staffs to be significant at the .005 level.

Comparisons of the staff characteristics in Tables 35 and 36 indicate that job qualifications as described in the temporary phase were followed since the permanent staff was better educated and a more homogeneous group as shown by the range parameters. This homogeneity suggests that the members of the permanent staff were more alike than those of the temporary staff on variables such as age, education, and size of family.

## II. Shelter Handbook

### A. Temporary Phase

To evaluate the use of the Handbook, each shadow staff member was to rate every step of each phase for his assigned shelteree staff member. Performance was assessed in terms of percentage task completion and in terms of quality of performance. For the latter, a rating scale of 1 (bad) to 5 (excellent) was utilized.

Table 35  
Temporary Shelteree Staff Characteristics  
(ES VIII)

Position	Age <sup>a</sup>	Sex	Occupation	Education in Years <sup>b</sup>	Marital Status	No. of Children in Shelter <sup>c</sup>	No. of Family Members in Shelter <sup>d</sup>
Emergent Shelter Manager	45	F	Machine Operator	13	Married	3	4
Assistant Shelter Manager	37	M	Research Physiologist	21	Married	5	6
Director of Operations	29	M	Naval Officer	16	Married	4	5
Radio logical Monitor	17	M	Student	11	Single	0	2
Director of Security	38	F	Housewife	11	Married	5	6
Head of Fire Control Team	16	M	Student	10	Single	0	0
Door Guard	18	M	Student	11	Single	0	2
Director of Communications	34	F	Machine Operator	8	Married	3	3
Director of Supply	41	M	Farm Manager	10	Married	5	6
Medical Man	40	M	Farmer	11	Married	3	4

<sup>a</sup>Mean Age: 31.5; Age Range: 16-45; Median Age: 35.5 yr.

<sup>b</sup>Mean Education: 12.2; Education Range: 8-21; Median Education: 11 yr.

<sup>c</sup>Mean No. of Children: 2.8; No. of Children Range: 0-5; Median No. of Children: 3

<sup>d</sup>Mean No. Family Members: 3.8; No. Family Members Range: 0-6; Median No. Family Members: 4

Table 36

Permanent Shelteree Staff Characteristics  
(ES VIII)

Position	Age <sup>a</sup>	Sex	Occupation	Education in Years <sup>b</sup>	Marital Status	No. of Children <sup>c</sup> in Shelter	No. of Family Members
Shelter Manager	23	M	Naval Officer	16	Single	0	0
Assistant Shelter Manager	30	M	Student	17	Married	0	1
Director of Activities	22	F	Secretary	12	Married	0	1
Director of Training	27	F	Housewife	16	Married	0	1
Director of Operations	23	M	Naval Officer	16	Married	0	0
Director of Supply and Maintenance	23	M	Naval Officer	16	Single	0	0
Director of Radiological Monitoring and Communications	25	M	Fireman	12	Single	0	0
Head of Fire Control Team <sup>e</sup>	25	M	Fireman	12	Single	0	0
Administrative Clerk	31	M	Not Available	12	Married	2	3
Head of Shelter Medical Staff			Physician				

<sup>a</sup>Mean Age: 25.4 yr.; Age Range: 22-31; Median Age: 25 yr.<sup>b</sup>Mean Education: 14.3 yr.; Education Range: 12-17; Median Education: 16 yr.<sup>c</sup>Mean No. Children: .2; No. Children Range: 0-2; Median No. Children: 0<sup>d</sup>Mean No. Family Members: .7; No. Family Members Range: 0-3; Median No. Family Members: 0<sup>e</sup>Same shelteree served in both capacities.

As Table 37 and Figure 10 demonstrate, 65.6% of the Handbook's temporary phase instructions were completed. The average rating of those tasks completed was 3.14. In comparing the per cent of temporary phase instructions completed in ES VII, (49.0%) and the average rating (2.54), with the per cent completed in ES VIII, it is clearly evident that the temporary phase was transacted more efficiently in ES VIII.

The average per cent of Section Leader instructions carried out in ES VIII varied from 14.2% to 100%, due to the fact that some sections were late in forming. This seemed to be a problem also in ES VII.

Radiological monitoring was carried out without any trouble. The temporary Radiological Monitor had no difficulty in setting up or checking the survey meter, and he followed the other instructions as directed.

Another improvement made in ES VIII over ES VII was the count taken by the Census Taker in the temporary phase. The count taken was 344, as compared with the 329 (321 plus eight CDR observers) people actually in the shelter. This count was taken as people filed in the door. The Census Taker did inform the Shelter Manager when the shelter was filled to capacity and the shelter door was closed as instructed.

With regard to overall management efficiency, there were four primary differences between ES VII and ES VIII:

1. ES VII was a one-week study, whereas ES VIII was a weekend study.
2. Ss in ES VII were told about the Handbook in a talk before entering the shelter; Ss in ES VIII were told about the Handbook, but more emphasis was placed on the fact that they would have to run the shelter themselves, and assume job responsibilities.
3. The Handbook in ES VII was changed for ES VIII in that instructions were simplified and shortened for all staff positions; instructions for the temporary Radiological Monitor were completely revised for ES VIII.
4. The proximity of the camera crew in ES VII had a noticeably adverse effect on the TSM in that study.

Figure 10 reflects the increased number of task completions in ES VIII, as compared to ES VII. The reasons for the observed improvements are thought to be a combination of the four differences previously stated.

Table 37

Shadow Staff Evaluation of Shelter Leadership Performance  
(ES VIII)

Phase	SM	ASM	DO	DSM	DA	DT	TD	AC	DG	CT	DRMC	HFCT
Temporary Phase	100 2.75 <sup>a</sup>	100 5.0	90.0 ---	-- ---	-- ---	-- ---	60.0 ---	--	100 2.0	100 4.6	--	66.6 2.25
Transition Phase	100 3.80	-- ---	-- ---	-- ---	-- ---	-- ---	-- ---	-- ---	-- ---	-- ---	--	--
Permanent Phase	44.0 1.83	50.0 3.0	42.1 4.16	-- --	-- --	-- --	-- --	-- --	-- --	-- --	--	--
Saturday	75.0 3.33	87.5 4.66	44.4 3.66	46.1 2.66	69.2 5.0	100 5.0	--	100 4.0	--	--	80.0 3.50	75.0 3.65
Sunday	82.0 3.33	83.3 4.75	61.5 2.80	18.1 2.50	84.6 5.0	66.6 --	--	-- --	--	--	76.4 3.61	100 3.62
Average for Each Position for Permanent Phase	67.0 2.83	73.6 4.13	49.3 3.54	32.1 2.58	76.9 5.00	83.3 5.0	--	100 4.00	--	--	78.2 3.55	87.5 3.64
										(Contd.)		

Table 37 (contd.)

Phase	SL	SL	SL	SL	SL	SL	SL	SL	SL	SL	SL	Overall Averages for Each Phase or Day
Temporary Phase	57.1 1.75	50.0 3.0	60.0 4.33	14.2 1.0	100 3.71	---	14.2 2.0	---	57.1 3.50	14.2 3.50	55.6 <sup>b</sup> 3.14C	
Transition Phase	---	---	---	---	---	---	---	---	---	---	---	
Permanent Phase	---	---	76.9 3.66	100 2.0	27.7 4.0	---	30.0 3.0	100 3.0	69.2 3.70	70.5 3.70	61.0 4.41	3.21
Saturday	53.8 4.0	---	61.5 3.71	55.5 3.4	38.4 ---	30.7 4.0	30.7 3.0	54.5 3.0	100 3.0	75.0 3.66	55.4 5.0	3.84
Sunday	75.0 4.16	---	61.5 4.0	71.4 3.0	45.4 ---	---	15.3 3.0	66.6 3.50	85.7 3.66	77.7 3.66	56.9 5.28	3.73
Average for Each Position for Permanent Phase	64.4 4.08	---	66.6 3.79	75.6 2.80	37.1 4.0	30.7 4.0	25.3 3.0	73.7 3.16	84.9 3.67	74.4 4.90	54.4 3.59	

<sup>a</sup>Rating Key: 1--Bad; 2--Poor; 3--Average; 4--Good; 5--Excellent

### Mean Percentage

### Mean Rating

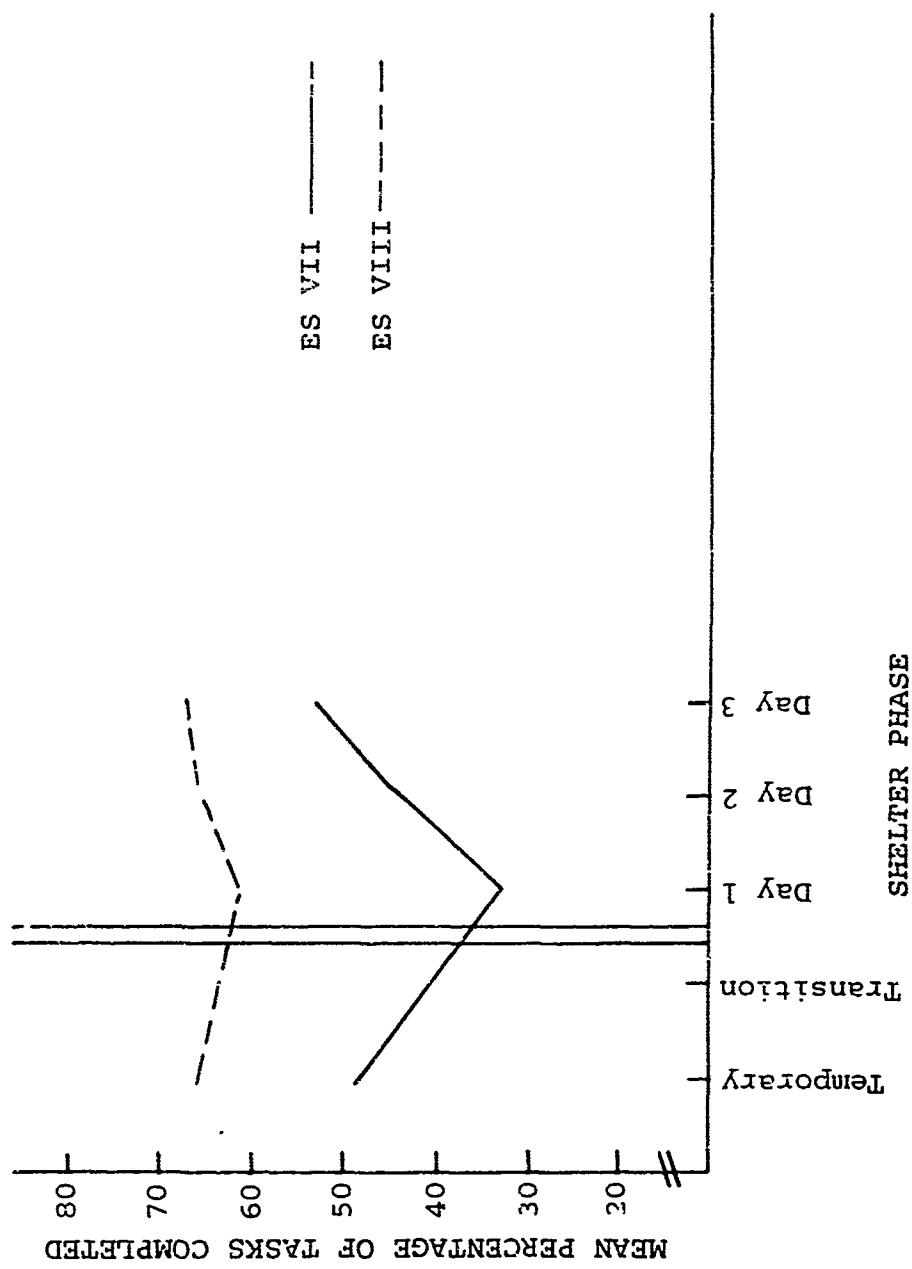


Figure 10. Comparison of daily Handbook tasks completed by ES VII and ES VIII shelteree staffs.

Table 38 gives a frequency distribution of the shadow staff's Handbook evaluation. Table 39 reflects the shelteree staff's views on similar questions.

#### B. Transition Phase

The transition phase began approximately three hours after shelter entry, an hour less than for ES VII. During the transition phase the Shelteree Information sheet data were followed closely in the selection of the permanent staff. The suggested job requisites were followed when possible. In both ES VII and ES VIII the Shelteree Information sheet proved a success and greatly aided in the selection of a competent permanent staff.

One of the temporary Shelter Managers with the aid of the temporary Assistant Shelter Manager completed 100% of the steps required in the transition phase (78% in ES VII). It was due to this careful completion of the instructions provided for the transition phase that a good permanent staff was selected for ES VIII.

#### C. Permanent Phase

Table 37 indicates the percentage of Handbook tasks completed in the permanent phase. The permanent staff performed 64.4% of the tasks with a mean rating of 3.59. Corresponding data for ES VII were 46% and 3.55.

##### 1. Shelter Map

Contrary to Handbook directions, no shelter map was made to show where the named items were located in the shelter.

##### 2. Suggested Shelter Schedule

The schedule used by the shelterees was for the most part the schedule suggested. Instead of the suggested bedtime of 11:00 P.M., the shelterees used 10:00 P.M. as bedtime after the first night.

##### 3. Shelter Log

The Administrative Clerk failed to function in ES VIII. No shelter log or other administrative records were kept.

##### 4. Food and Water Calculations

The Director of Operations followed the ration tables provided in his instructions to determine the food and water ration for each shelteree.

Table 38

Shadow Staff Evaluation of Staff Structure in  
the Temporary and Permanent Phases  
(ES VIII)

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Temporary Phase		Permanent Phase	
1.	Do you feel that this position would be important in case of a real emergency?	<u>Yes</u> 17	<u>No</u> 0
2.	Did the shelteree staff member you were shadowing have too much to do?	<u>Yes</u> 2	<u>No</u> 15
3.	Were the Handbook instructions for this position easy to read and understand?	<u>Yes</u> 16	<u>No</u> 1
4.	Did the instructions for this position fully describe the duties required?	<u>Yes</u> 15	<u>No</u> 2
5.	Did the shelteree staff member you were shadowing work well with the other shelteree staff members?	<u>Yes</u> 14	<u>No</u> 3
6.	Should the shelteree staff have been larger or smaller, or was it adequate?	<u>Larger</u> 0	<u>Adequate</u> 12
		<u>Smaller</u> 5	<u>Larger</u> 1
			<u>Adequate</u> 18
			<u>Smaller</u> 1

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(Contd.)

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Table 38 (Contd.)

	Temporary Phase	Permanent Phase		
7. Did the other shelterees respect and recognize your shelteree staff member's authority?	<u>Yes</u> 15	<u>No</u> 2	<u>Yes</u> 15	<u>No</u> 5
8. Do you like the manner in which the shelteree staff member that you were shadowing was selected?	<u>Yes</u> 9	<u>No</u> 8	<u>Yes</u> 9	<u>No</u> 11
9. Do you think qualified shelterees would have volunteered to become staff members had they not been selected?	<u>Yes</u> 14	<u>No</u> 3	<u>Yes</u> 17	<u>No</u> 3
10. Do you like the new way your section of the Handbook was organized?	<u>Yes</u> 15	<u>No</u> 2	<u>Yes</u> 17	<u>No</u> 3
11. Under emergency conditions, would the instructions given for your staff position have been adequate?	<u>Yes</u> 15	<u>No</u> 2	<u>Yes</u> 14	<u>No</u> 6
12. Do you think you could have survived in a shelter for 2 weeks (being untrained) with 300 people without a handbook?	<u>Yes</u> 12	<u>No</u> 5	<u>Yes</u> 14	<u>No</u> 6
13. Do you think in-shelter shadowing is a good method to evaluate the Handbook and shelter activities?	<u>Yes</u> 16	<u>No</u> 1	<u>Yes</u> 19	<u>No</u> 1

Table 39

Shelteree Staff Evaluation of Staff Structure in  
the Temporary and Permanent Phases  
(ES VIII)

	Temporary Phase	Permanent Phase				
1. Do you feel that your job would be important in case of a real attack emergency?	<u>Yes</u> 11	<u>No</u> 0	<u>Yes</u> 20	<u>No</u> 0		
2. Did you have too much to do?	<u>Yes</u> 11	<u>No</u> 0	<u>Yes</u> 2	<u>No</u> 18		
3. Were your instructions easy to read and to understand?	<u>Yes</u> 11	<u>No</u> 0	<u>Yes</u> 20	<u>No</u> 0		
4. Did your instructions fully describe your duties?	<u>Yes</u> 10	<u>No</u> 1	<u>Yes</u> 17	<u>No</u> 3		
5. Did your staff work well together?	<u>Yes</u> 11	<u>No</u> 0	<u>Yes</u> 20	<u>No</u> 0		
6. Should the staff have been larger or smaller, or was it adequate?	<u>Larger</u> 1	<u>Adequate</u> 10	<u>Smaller</u> 0	<u>Larger</u> 2	<u>Adequate</u> 18	<u>Smaller</u> 0
7. Did the other shelterees respect and recognize your staff authority?	<u>Yes</u> 11	<u>No</u> 0	<u>Yes</u> 20	<u>No</u> 0		

(Contd.)

Table 39 (Contd.)

	Temporary Phase	Permanent Phase		
8. Did you like the manner in which you were selected to be a staff member?	<u>Yes</u> 10	<u>No</u> 1	<u>Yes</u> 15	<u>No</u> 5
9. Would you have volunteered to become a staff member had you not been selected?	<u>Yes</u> 10	<u>No</u> 1	<u>Yes</u> 16	<u>No</u> 4
10. Did you like the way your section of the Handbook was organized?	<u>Yes</u> 10	<u>No</u> 1	<u>Yes</u> 18	<u>No</u> 2
11. Under emergency conditions would the instructions given you have been adequate?	<u>Yes</u> 9	<u>No</u> 2	<u>Yes</u> 18	<u>No</u> 2
12. Do you think you could have survived in a shelter for two weeks with three hundred people without a handbook?	<u>Yes</u> 5	<u>No</u> 6	<u>Yes</u> 15	<u>No</u> 5

The use of the revised ration tables of ES VIII proved to be easier, faster, and more accurate in the determination of the shelteree food and water ration than the method used in ES VII.

#### 5. Section Leader's Meal Check-Off List

A new form provided for ES VIII was the Section Leader's Meal Check-Off List. This form was kept by the Section Leader and was used in the distribution of food to insure equity of distribution.

#### 6. Radiological and Communications Monitoring

During the permanent phase, the Radiological Monitor was told to use a survey meter programmed to give simulated readings of outside dose levels. The dose levels were then recorded by the Monitor in the Radiological Monitor's Log. This log proved completely successful in ES VIII.

The Communication Monitor's Log was not properly kept. The messages were not legible or understandable. However, the Communication Monitor did respond well to EOC contact.

#### 7. Supply Inventory Form

Another new form provided in ES VIII was the Supply Inventory form. This form was accurately filled out by the Director of Supply and Maintenance except for the number of radiological kits, and the number of sanitation kits. This form provided a needed guide for taking an inventory of stocked supplies.

#### 8. Section Leader's Selection Form of Assistants

No records were made of any use of this form. Whenever assistants were needed, the director concerned chose them himself.

#### 9. Alternate Shelteree Staff

Due to the brevity of ES VIII, no alternate staff was formed. However, assistants for each shelteree staff position were selected, in anticipation of this next step in staff organization.

### D. Conclusions

ES VIII was more successfully implemented than ES VII. The triumvirate temporary Shelter Manager procedure was soon effective in initiating the temporary phase. Other phases followed fairly smoothly.

In the permanent phase, the food ration table method of determining the food and water ration proved successful, as did the Section Leader's Meal Check-Off List and the Supply Inventory form.

Findings in this study, as well as those of ES VII, indicate that the present permanent staff organization is sufficient for a 300-person shelter configuration.

#### E. Recommendations

Recommendations for improving the Shelter Handbook follow:

1. A Section Leader's Water Check-Off list needs to be added to ensure equitable water distribution.
2. Further improvements are needed as log instructions; e.g., examples of data to be recorded in the Communication Monitor's Log.
3. The Supply Inventory form should be correlated with the Shelter Map form for easier reference.
4. Various methods of temporary phase shelter organization should be evaluated to improve further this vital aspect of shelter organization.

### III. Shelter Shadow Staff Training

#### A. Shadow Technique

Shadow staff training and procedures followed during ES VIII have already been discussed. Upon conclusion of the study the shadow staff was immediately debriefed by the Civil Defense Research staff. Two weeks after the study a report was also required of all shadow staff members for use in data analysis and critique.

#### B. Shelter Management Training Value

A shadow staff training critique was filled out by each shadow staff member two weeks after the study (ES VIII). From this information it was determined that one day (7 hours) of formal training was adequate for shadow staff training and that less formal training might prove adequate. It was also determined that the classroom method used was preferred over other possible training methods.

## Chapter 20 - In-Shelter Program

### I. In-Shelter Activity Schedule

The temporary phase began Friday, 10 September, at 4:22 P.M., with the entry of two females, shortly followed by a third. These first persons into the shelter were directed to the in-shelter copy of the Handbook by a sign on the shelter door. They briefly examined the box containing the Handbook. At 4:26 P.M., two of them started passing out the instruction leaflets. Concurrently with the arrival of more Ss, the distribution of leaflets continued. The emergence of a staff was facilitated by the way the Assistant Shelter Manager, a 37-year-old male, took charge. One of the Shelter Managers, a 47-year-old female, approved of this readily. The Assistant Shelter Manager made all of the announcements, called all of the meetings, and generally supervised the formation of a staff.

While the staff was being formed, the other Ss wandered about the first few minutes. Dominion over a space was established by spreading out bedding. Other activities during this phase were playing cards, other small games such as checkers, conversation, and smoking.

The Ss' response to the staff was favorable. They were cooperative when the staff asked them to do something.

The staff organization did not develop in strict accordance with the Handbook. Sections were late in being formed, and Section Leaders were late in being appointed. However, the Commode and Medical Areas were promptly put into operation.

One problem during this phase was finding people willing to do the necessary jobs. This was solved by continually asking different people until a volunteer was found.

The transition phase, the change-over from the temporary to the permanent phase, lasted approximately one hour. During this period, the Shelteree Information sheets were checked by the one functioning Shelter Manager, Assistant Shelter Manager, and most of the Section Leaders. Those Ss who were qualified for staff positions were asked if they would accept. Most of those asked readily accepted, and the transition phase operated smoothly.

The permanent phase lasted from 8:00 P.M. Friday night until study termination at 4:30 P.M. Sunday afternoon. This phase was characterized by the development of an organized routine that was especially adapted to shelter living.

The suggested shelter schedule was for the most part followed. The only variance between it and the schedule actually followed in the

shelter was the timing of an afternoon water break, and bedtime. The schedule followed in the shelter met with the approval of most of the Ss.

Sanitation procedures were improved. An efficient staff, interested Ss, and material to work with, i.e., brooms, mops, and rags, provided the proper combination to maintain a fair degree of cleanliness.

Space utilization was poor in the sense that very few aisles or open spaces appeared. Although travel from one part of the shelter to another sometimes necessitated stepping on other Ss' possessions, few of the individuals complained. Apparently, Ss were content to remain in their chosen spaces.

#### A. Feeding Activities

The Director of Operations is responsible for food and water distribution in the shelter. The Handbook recommends four food and water distribution periods per day with two additional water distribution periods interspersed among these. Prior research has determined that four meals (food and water) per day is a procedure better adapted to shelter life than the traditional three meals per day.

The only difference between the suggested and the actual food and water distribution schedule of ES VIII was that of time and sequence. Table 40 presents the comparison.

The first OCD shelter rations were dispensed at 8:00 P.M., Friday, September 10, approximately four hours after shelter entry. Some Ss had begun eating the food adjuncts brought with them prior to this time. In fact, since some Ss had brought ample food adjuncts with them, they did not always eat all their allotted OCD rations, giving them to others or throwing them away.

Food and water were distributed by the fixed-point method. Section Leaders reported to a central dispensing point to get the crackers and carbohydrate supplement, then returned to their sections to distribute them. The Handbook provides a Meal Check-Off List for each SL to maintain for Ss in his section. Food sanitation was not adequately enforced. However, food handlers made a cleansing solution of hand cleaner and water which partially offset the effect of the bare hands in contact with the food.

Water stations were set up at strategic locations, with two points serving as the distribution centers for all sections downstairs. Water was dispensed by dipping a cup (with the holder's hand in it) directly into the water drum, then pouring it into the individual's cup. Failure to get the siphon tubes operating properly contributed to further sanitation problems. Purification tablets were not used in the first water drums opened.

Table 40  
Proposed and Actual Feeding Schedule  
(ES VIII)

Schedule	Proposed Time	Actual Time
Food and water distribution	8:00 A.M.	7:00 A.M.
Water distribution	10:00 A.M.	10:00 A.M.
Food and water distribution	12:00 Noon	12:00 Noon
Food and water distribution	4:00 P.M.	3:00 P.M.
Food and water distribution	8:00 P.M.	5:30 P.M.
Water distribution	10:00 P.M.	8:30 P.M.

The plastic cups used in ES VIII were fragile and, unless they were handled carefully, frequently split. Cup racks suggested by the supplement were not made.

#### B. Sleeping

The Director of Operations is responsible for sleeping arrangements. The Handbook suggests an eight-hour sleeping period at night and a one-hour rest period in the afternoon. This suggestion was followed in ES VIII, although Ss were allowed a nine-hour sleeping period the second night in the shelter. During the day some Ss slept at times other than the scheduled rest period; some even slept during the temporary phase.

Most Ss brought some bedding with them, either blankets, sleeping bags, air mattresses, or cots. Some spread out their bedding almost immediately upon entry, evidently to claim space. Although each person theoretically had ten square feet of space, some of the bedding, especially the cots, took up more than the allotted space. As no instructions were given to roll up and store any of the bedding during the day, some of the bedding initially put down was not moved until the study ended. Some active supervision by the Director of Operations would have alleviated the problem, e.g., he might have suggested that four family members share three air mattresses instead of using four.

Organizing the shelter for sleeping proved somewhat of a problem. Although the Handbook recommends separation of single men and women, this was not done. The reluctance of the Ss to move once they were settled, in addition to lack of concern or supervision by the staff, made this arrangement difficult to implement.

Poor space utilization caused by the awkward arrangement of sleeping equipment made some Ss extremely cramped for sleeping space, while others were quite comfortable. Although some sections utilized their space better than others, the initial, haphazard placing of bedding on the floor seemed to set the pace for the entire study. Aisles were virtually nonexistent. Some sections managed to arrange small aisles, but even these fluctuated in size and duration. Movement was accomplished only by stepping over people or on their property.

In future studies more active, efficient supervision is needed to ensure better sleeping arrangements.

#### C. Training

The training sessions were held at the intervals suggested and in the sequence suggested by the supplement. The lectures were given according to the following schedule: Saturday at 11:00 A.M. and

2:00 P.M., and Sunday at 11:30 A.M. and 2:00 P.M. The large room on each floor was used. Lectures were independently held on each of the two floors and lasted about 15 minutes. Usually, the downstairs lecture was given first. Lectures, with the exception of the first aid lecture, were given by a male Section Leader who was an experienced teacher, and were well received by the Ss. The Sunday morning lecture was given by a M.D. Although he digressed somewhat from the subject, the Ss' response was quite favorable. The last lecture on Sunday afternoon did not meet with as much approval by the Ss as prior lectures, undoubtedly because of the nearness of shelter release time.

The first training lecture, entitled "Adjusting to Shelter Life," was a composite of the first two lectures in the supplement. It was given downstairs at 11:00 A.M. by a Section Leader and upstairs at 11:15 A.M. by the Director of Training. It lasted ten minutes.

The second training lecture was on radiation. The downstairs lecture started at 2:10 P.M. and ended at 2:30 P.M. The first five minutes was spent on the "Effects of Radiation" and the last ten minutes on "Protection from Radiation." The upstairs lecture started at 2:30 P.M. The identical topic was covered in the same sequence by the lecturer. Both lectures were by a Section Leader.

There was much reading of the lectures the first day, probably due to lack of time for preparation and to the technical nature of the radiation lecture.

The first training lecture on Sunday, September 12, 1965, was held upstairs at 11:00 A.M. One of the in-shelter physicians lectured for about 25 minutes on "First Aid," concluding the training session with a question-and-answer period. He then moved downstairs and spent 30 minutes with them on the same topic, although digressing briefly from it. At the conclusion of the lecture, the Ss applauded.

The final training session was a ten-minute lecture on "Decontamination Procedures." It was presented by a Section Leader downstairs at 1:50 P.M. and upstairs at 2:05 P.M.

#### D. Medical Area

The shelteree acting as temporary Medical Man efficiently inventoried the medical supplies during the temporary phase. Later the CDR physician assumed control of the Medical Area.

The Medical Area was initially located downstairs near the command post. About midway in the temporary phase, it was relocated upstairs near the stairway.

Once located, the area was identified by a sign reading "Medical Area." The presence of the medical staff, the medical kit and a water drum also served to further identify the area.

The medical staff, selected by Civil Defense Research prior to the beginning of the study, consisted of two physicians and three registered nurses. The physicians alternately worked an eight-hour shift. Each nurse worked one eight-hour shift daily.

The suggestions received from post-study medical reports fall into two categories--location and supplies. Suggested improvements regarding the location of the Medical Area include (1) more space, (2) better ventilation, and (3) better lighting. The general comments about supplies concerned adequacy and amount. The stocked in-shelter medical kit was deemed adequate only for minor complaints. It was also suggested that the Medical Area be furnished with at least one cot and a few shelves.

#### E. Nursery

One of the Director of Activities' responsibilities is the nursery. Two paragraphs in the supplement expand on the instructions contained in the Handbook relating to the operation of the nursery.

The first nursery period was held on Saturday morning during the training lecture. The two small downstairs rooms were permanently designated and utilized as nurseries. The children were divided, according to age, into two groups. Ages one through six comprised one group and those seven through twelve the other. Teen-agers, as suggested in the Handbook, were used as assistants. Typical children's games were played. The nursery periods averaged about 15 minutes. Since the nursery was held in conjunction with the training lectures, there were four nursery periods during the study.

The most common complaints about the nursery were: (1) too short, and (2) not enough supervision or leadership. Two other complaints were those of bored children and not enough material to work with.

The suggestion was made that the location of the nursery be rotated within the shelter. This procedure would equalize movement of Ss to make room for the nursery.

Under the conditions in ES VIII, the nursery was adequate. However, in a longer study the nursery would require more planning and supervision. More and longer nursery periods would also be desirable.

#### F. Religious Activities

Religious activities are supervised by the Director of Activities. The supplement contains a section pertaining to this activity to aid him in carrying out his tasks.

A non-denominational Sunday morning service was held in the large downstairs room for the entire shelter population. It closely

resembled the order of service suggested in the supplement. The Ss' response was most favorable. Group acceptance of the religious service equalled that of any other activity.

The only vesper service was held upstairs Saturday night just prior to lights out. The lack of any vespers downstairs may have occurred because either the Director of Activities and the other staff members or the Ss saw no need for any.

Even though a Bible was stocked, no reading of it by individuals was reported.

#### G. Recreation

Entertainment is a help to morale and an antidote for boredom. The Director of Activities is responsible for organizing group recreational activities. The recreational section of the supplement is designed to be used as reference material, to supplement practical knowledge.

Most forms of recreation were either individual or small-group activities, including reading, knitting, doing school homework, listening to radios, smoking, talking, and playing games such as cards and checkers. No games were made from in-shelter material, since Ss evidently brought in their own recreational material. The Ss seemed satisfied by individual, sedentary-type activities.

The major group activity was a twenty-minute Saturday evening talent show. It was first held upstairs, then later in the large downstairs room. Almost all of the Ss attended and registered their approval with applause.

Space utilization definitely affected the children's activities. The children were severely limited for space, since the Ss' bedding remained on the floor. By day the stairway was the children's play area, by night, the smoking area. On Sunday afternoon, most Ss had already packed all of their gear in preparation for exit. Several children took advantage of this available space by playing "Ring-Around-The-Rosey."

#### H. Exercise

The supplement has a section on exercise covering when, why, and what kind of exercise to give.

The Director of Activities led a group exercise period on Saturday afternoon in Rooms A and C. The Section Leader in Room B attempted to have a daily exercise period in her section but received extremely poor response.

Several explanations may be offered as to why there was only one exercise period during the study. The first is that of space utilization. The Ss kept their bedding down all the time. Since they were not required to get up, roll up their bedding, and clear the middle of the floor, there was no space for group exercises. Another explanation might be that the confinement period was too short for Ss to consider exercising important.

Over a longer period of confinement, the amount of exercise each S had during this study would be completely insufficient. A possible remedy would be to place greater emphasis in the Handbook on the importance of regular exercise.

## II. Medical Complaints

As part of their responsibility for the health of shelterees, the physicians and nurses were provided with Medical Record forms on which to keep accurate accounts of complaints registered with them. Table 41 presents an age and sex breakdown of medical complaints during each eight-hour medical shift of ES VIII, and on the basis of this ordering of complaints the following observations may be made:

- A. A total of 105 complaints was registered during ES VIII, 42% coming from males and 58% from females.
- B. The largest number of medical complaints came from adults 20-39 years of age (43% of the total complaints registered). Adults 40-54 years of age registered 22% of the total medical complaints; children 12 years of age or younger, 19%; teen-agers, 15%; and adults 55 years of age or older, 1%.

As to the nature of complaints brought to the in-shelter physicians, headaches were the most prevalent by far, and mentioned more often by female Ss. (See Table 42 for a daily breakdown by sex of the nature of all complaints.) The brevity of ES VIII makes it difficult to see trends in medical complaints; however, even cursory examination indicates an increase in complaints of colds and sore throats and nausea in particular and a scattering of other more diversified problems in general.

## III. Post-Shelter Medical Reports

### A. Physicians' Report

The location of the Medical Area in the second floor room of the shelter at the head of the stairway was undesirable. The area did not have sufficient ventilation or temperature control. In addition, there was no way to control the constant flow and noise of human traffic which had to pass through the area in either entering or leaving the

Table 41

Number of Medical Complaints  
(ES VIII)

Shift	Age Group	Sex		Total
		M	F	
Friday	12 and under	3	0	3
3:00 P.M. -	13-19	2	1	3
11:00 P.M.	20-39	1	2	3
	40-54	1	2	3
	55+	0	0	0
Friday 11:00 P.M. - 7:00 A.M. Saturday		None Whole Shift		
Saturday	12 and under	1	1	2
7:00 A.M. -	13-19	4	2	6
3:00 P.M.	20-39	6	11	17
	40-54	1	3	4
	55+	0	0	0
Saturday	12 and under	3	4	7
3:00 P.M. -	13-19	2	4	6
11:00 P.M.	20-39	4	8	12
	40-54	6	2	8
	55+	0	0	0
Saturday 11:00 P.M. - 7:00 A.M. Sunday	12 and under	0	1	1
	13-19	0	0	0
	20-39	1	0	1
	40-54	1	1	2
	55+	0	0	0
Sunday	12 and under	5	2	7
7:00 A.M. -	13-19	1	1	2
3:00 P.M.	20-39	2	10	12
	40-54	1	4	5
	55+	0	1	<u>1</u>
		45	60	105 Grand Total

Table 42

Nature of Medical Complaints  
(ES VIII)

Diagnosis Compared with ES VII	Fri. 3-11			Sat. 11-7			Sat. 7-3			Sat. 3-11			Sun. 11-7			Sun. 7-3			Total			
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	
Headaches	3	2	5	---	---	---	7	9	16	11	11	22	---	---	2	9	11	23	31	54		
Cuts and Abrasions	3	--	3	---	---	---	1	2	3	1	1	2	---	---	2	1	3	7	4	11		
Boils and Infections	--	--	--	---	---	---	1	--	1	---	1	--	---	1	--	1	2	--	2	--	--	
Nervous	--	--	--	---	---	---	---	---	---	---	---	---	---	---	1	--	1	2	--	2	--	--
Constipation	--	--	--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Insomnia	--	--	--	---	---	---	---	---	---	---	---	1	--	1	--	1	--	1	--	1	--	1
Allergy,	--	--	--	---	---	---	---	1	1	--	1	1	---	---	---	1	1	---	3	3	3	
Rash	--	--	--	---	---	---	---	1	1	---	1	1	---	---	---	1	1	---	3	3	3	
Cold, Sore Throat	1	--	1	---	---	---	---	1	--	1	--	1	---	---	2	1	3	4	1	5	1	5
Nausea	--	--	--	---	---	---	1	--	1	--	3	3	---	---	1	2	3	2	5	7	2	--
Diarrhea	-	--	--	---	---	---	---	1	--	1	--	1	---	---	1	--	1	2	--	2	--	2
Ear and Toothaches	--	1	1	---	---	---	---	1	--	1	---	1	---	---	---	---	---	1	1	2	1	4
Backaches	--	--	--	---	---	---	---	2	2	--	1	1	---	---	---	---	1	1	1	1	--	4
Miscellaneous <sup>b</sup>	--	2	2	---	---	---	1	1	1	---	---	---	---	---	---	3	3	3	3	3	3	6
Defection Exam	--	--	--	---	---	---	2	2	4	---	1	1	1	2	3	---	---	3	5	8	3	5
Total	7	5	12	0	0	0	12	17	29	15	18	33	2	2	4	9	18	27	45	60	105	

<sup>a</sup>The absence of "Nervous" complaints in ES VIII, as compared with the prevalence of this complaint in ES VII, may be explained by (1) the ES VIII physicians' use of specific categories rather than the "Nervous" category, and (2) the shorter duration of ES VIII.

<sup>b</sup>Anxiety, sprained ankle, insect bites, dysmenorrhea.

second floor. Space was at such a premium that there was no possible way for a patient to lie down comfortably. The designation and delineation of an appropriate Medical Area before the shelter is inhabited as such would be one solution to these problems.

The medications provided in Medical Kit C are inadequate for emergency care. The supplies as stocked are satisfactory for only a limited number of minor complaints, since even these cannot be adequately cared for without a stronger pain medication and an anti-nausea medication.

The following emergency medications and supplies are needed: Epinephrine, Aminophylline, artificial airways, oxygen, tetanus toxoid, disposable syringes and needles, I.V. fluids and the necessary tubing and arm boards to administer them. In addition, the following ordinary medications and supplies are needed: Benadryl, one form of digitalis (digoxin or digitoxin), bandaids, morphine, and a cot. Powdered milk could be included in the medical supplies for distribution to infants in the shelter.

Sleeping conditions and space limitations could be improved with even limited provision of cots. By this means some persons could place their feet under cots on which other persons, particularly older or infirm members of the group, would be sleeping. Shelves and hooks would further enhance the availability of space.

Manual generators should be available in order to provide air circulation and lighting in the absence of electricity.

The procedure used in dispensing water was far from sterile. Often the siphon tubing was not satisfactory, and dipping from the water supply with a cup was improvised. During the first 18 to 24 hours of the study, no water purification tablets were used. As a correction for this potentially dangerous oversight, the Shelter Manager should be instructed to see that this is done quickly.

#### B. Registered Nurses' Reports

The location of the medical area at the head of the stairs on the second floor of the shelter was unsatisfactory. There was no privacy for examining those who came for medical attention, and there was hardly enough room to treat even minor complaints. At one point during the study, the medical staff asked the Shelter Manager to move the unit to a more appropriate place, but his request that a family in one of the smaller rooms on the first floor move out into the larger room was ignored, and the issue was not pressed further. The Shelter Manager should use his authority in such cases in order to make any changes in arrangements which would make shelter living more suitable.

The prevailing medical complaints during the night hours focused on headaches, nausea, insomnia and nervousness. (NOTE: The term "nervousness" was used by nurses, although there is an absence of this term in the ES VIII physicians' medical complaint records and reports. The ES VIII physicians, in contrast with the ES VII physicians, preferred to use diagnostic terms other than that of "nervousness.") Most of these were relieved by medications provided in Medical Kit C. However, there were complaints which could be more effectively treated with medications not now part of the medical supplies. The following supplies should be considered for addition to the medical kit: merthiolate, a cough preparation, antihistamine, stimulants, I.V. fluids, stronger analgesics, anti-nausea medication, an upright plastic container for soaking soiled thermometers, a basin for cleaning wounds, folding paper cups for dispensing medicine and water, adhesive tape, bandaids, and airways.

The method most used for dispensing water was unsanitary and could lead to health hazards. Through an oversight, probably due to inadequate early emphasis, water purification tablets were not put in the initial water supply. Emphasis should be placed on this procedure in order to ensure a pure water supply; instruction in this regard should be incorporated in the first pages of the Handbook. Also, further emphasis should be placed on the need for questioning patients concerning possible allergic reactions to penicillin, sulfa, aspirin, etc., before such medications are prescribed, particularly since it is possible that relatively untrained persons will be in charge of medical care in the shelter.

Having a suitable Medical Area marked as such prior to confinement would alleviate many of the problems encountered in this study.

Cleanliness poses an inevitable problem. However, persons should be able to clean their hands after using the toilet, and this was not possible in the study. Also, Section Leaders should be given suggestions for care of drinking cups.

#### IV. Shelteree Reactions

##### A. In-Shelter Events

###### 1. Shelter Management Staff Activities--September 10, 1965, 4:00 P.M.-8:00 P.M.

By the end of the first hour, a temporary shelteree staff had emerged from the population. Actual entry into the shelter occurred at 4:22 P.M. At 4:23 P.M., the nucleus of a staff was formed. At that time, the first two adults (females) to enter the shelter picked up the box that contained the instructions pertaining to each staff position. These two females were shortly

thereafter joined by a third female. One of the females became the temporary Shelter Manager, although the temporary Assistant Shelter Manager, a 37-year-old male assumed the role of communicating temporary SM decisions almost immediately after being appointed. He made all of the announcements and asked people to accept the different jobs. The command post was set up along the wall in the large downstairs room. At 4:50 P.M., the temporary Assistant Shelter Manager asked people to move into the small rooms.

During this first hour, all of the job sheets were passed out with the exception of some of the Section Leaders' packets. The individual staff members, with the exception of the Traffic Director, busied themselves with their respective tasks. The temporary Head of the Shelter Medical Staff located the Medical Area adjacent to the command post and started his inventory of the medical kit. The temporary Director of Operations began setting up the commodes in the downstairs Commode Area. The temporary Radiological Monitor was discouraged by the temporary Assistant Shelter Manager from going outside the shelter; but after reading his instructions again, he went outside anyway. The 5:00 P.M. outside radiological reading was .5 mr/hr. The temporary Traffic Director, at the prompting of the temporary SM, started appointing Section Leaders. The Census Taker tried to get an accurate count of the Ss already in the shelter.

The second hour, from 5:00 to 6:00 P.M., evidenced the change from an embryonic staff to an efficient, functioning staff. Two commodes were operational at 5:10 P.M. No commodes were set up on the upstairs floor, so all Ss used the downstairs commodes. Extra commodes were moved into the Commode Area. The temporary Head of the Shelter Medical Staff completed his inventory of the medical kit and activated the Medical Area. The Section Leaders were busy organizing their sections, making announcements, and collecting data for the Shelteree Information sheets. The Section Leader in Room B announced that there was space for a few more people. There was a change of Section Leaders in Room A from a woman to a teen-age male.

The temporary staff continued working efficiently during the third hour, 6:00 to 7:00 P.M. The temporary Assistant Shelter Manager requested that the sleeping bags be moved closer together. The supplies were again moved in an effort to gain maximum floor space. All Ss were formed into sections. At 6:10 P.M., there was a general meeting of all Section Leaders downstairs. Apparently, the meeting was with the one functioning temporary Shelter Manager, Assistant Shelter Manager, and the remainder of the staff. At 6:30 P.M., a physician took over the medical station from the S who was the temporary Head of the Shelter Medical Staff.

During the fourth hour, the temporary staff were concerned with implementing the change-over to the permanent phase. An announcement was made that people were needed for the permanent staff.

## 2. Shelteree Activities--September 10, 1965, 4:00 P.M.-8:00 P.M.

Upon entrance, shelteree activity consisted of general wandering around the shelter and locating a place to sit. Initially, most Ss remained in the large downstairs room. The major problem in the first hour was getting people to assume responsibility quickly. The Ss listened to a "reassurance" talk by the temporary Assistant Shelter Manager. The noise level abated somewhat but was still loud during this talk.

After the second hour, the Ss finished arranging bedding. Upstairs, a group of people tried to climb over the shelter wall, but were unsuccessful in this attempt. Additional groups entered at 5:20 and 5:40 P.M. Most of the children and the teen-agers spent their time playing with toys and games brought in with them. Some of the adult Ss were sitting or lying on their bedding. The noise level was higher this hour because of crying children and loud radios.

By the third hour, 6:00 to 7:00 P.M., the shelter was organized to the point where a more relaxed atmosphere prevailed. Several groups were playing cards, some people were reading books and magazines, some smoking, and others talking. Despite some background noise, some of the small children managed to sleep. Mothers were busy caring for their children. Older children congregated into small groups. People were slow to respond to requests from the management but were generally cooperative.

During the fourth hour, 7:00 to 8:00 P.M., the children began to get restless. People with cots took up more than their share of room, causing resentment among some of the other Ss. Some Ss ate food and drank liquids brought in among personal possessions. Those Ss without water complained of thirst. Upstairs, drinking cups were distributed at 7:30 P.M.

## 3. Shelter Management Staff Activities--September 10, 1965 8:00 P.M.-12:00 Midnight

At 8:15 P.M., the Director of Supply and Maintenance made an announcement urging parents to keep children from requesting additional cups of water. At 8:34 P.M., the Director of Operations announced that all people should return to their respective sections for food. A staff meeting was in progress during the time of the announcements and ended just prior to 8:30 P.M. The Section Leader in Room B, at the first drinking

period warned the section to conserve their cups. A man from Room B, at 10:00 P.M., was appointed permanent Administrative Clerk. Room D Section Leaders appointed their watch for the night. At 10:12 P.M., the permanent Fire Watch asked people not to smoke except on the stairway. The Shelter Manager announced lights out at 11:00 P.M. Due to an extremely long line of females at their Commode Area, the lights were not turned out until 11:25 P.M., after all had had an opportunity to use the commode. This problem was resolved when the staff split the long line into two groups; one group used the female Commode Area, and the other the male Commode Area.

4. Shelters Activities--September 10, 1965, 8:00 P.M.-  
12:00 Midnight

During the first part of this period, people were busy getting their water cups and their ration of water, survival crackers, and carbohydrate supplement. Other than such routine activities as talking, reading, smoking, etc., the only significant event was the writing of diaries by the Ss about 9:30 P.M. A group of young people gathered together for a group singing at 10:50 P.M., which lasted about 25 minutes.

Most Ss were busy during the last hour making final preparations to bed down. Lights stayed on until 11:25 P.M., although it was previously announced that lights would be out at 11:00 P.M. The waiting line of females at their Commode Area caused the delay. People appeared to be looking forward to lights out, since some Ss had already gone to bed about 10:00 P.M.

5. Shelter Management Staff Activities--September 11, 1965,  
8:00 A.M.-12:00 Noon

The first problem facing the staff during this four-hour period was that of a leaky commode. The Director of Supply and Maintenance had it repaired by 10:30 A.M. The Director of Operations was also busy. He added water purification tablets at 10:20 A.M. to some upstairs water drums. During the last hour, from 11:00 A.M. to noon, he requested that the Ss be more conservative with toilet tissue and that they be more careful when using the commodes. He also suggested that parents accompany small children to the commode. Between 9:00 and 10:00 A.M., an announcement was made pertaining to cleaning up the rest rooms.

Training sessions were held during the last hour. The Director of Training gave a lecture to the Ss upstairs. One of the Section Leaders gave the same topic to those people downstairs. Just prior to the lecture, the Director of Activities was busy directing children to the nursery. At 11:15 A.M., a series of announcements was given by several staff members.

6. Shelters Activities--September 11, 1965, 8:00 A.M.-  
12:00 Noon

Inadequate space for movement was a constant problem for the Ss during this four-hour period. As the morning progressed, the noise increased until the end of the second hour, at which time it seemed to stabilize. The regular mealtime was at 8:10 A.M., and the water break at 10:00 A.M. There were no scheduled activities during this period. The Ss occupied themselves with games, conversation, smoking, and similar activities. Both the children and the adults utilized the same kinds of activities for passing the time. Usually the adults spaced themselves along the wall, leaving the space in the middle of the room for the children. In the large room downstairs the grouping was more on a sectional rather than a room basis. Overall, very little bedding was picked up to clear the floor. There was no general clean-up, but rather an intermittent clean-up during this time. At 9:30 A.M. the Section Leader in Room B recruited people from that section for the talent show.

One problem that emerged during the morning was communication. The sections in the small rooms seemed to be isolated from the large room. Most announcements were made in the large room, with Section Leaders relaying the information to their sections.

7. Shelter Management Staff Activities--September 11, 1965,  
12:00 Noon-4:00 P.M.

At the beginning of this period, the staff gave lunch instructions to the Ss. At 12:45 P.M. the Assistant Shelter Manager announced to the Ss in the upstairs room that there would be an afternoon rest period beginning at 1:00 P.M. At 2:00 P.M., the Manager announced to the downstairs Ss that the rest period was over and that it was time to exercise. The Assistant Manager made the same announcement to the upstairs Ss. A training lecture was held during the last hour. It was presented on each floor, since the staff did not deem it feasible to have a single shelter-wide lecture.

8. Shelters Activities--September 11, 1965, 12:00 Noon-4:00 P.M.

The Ss were busy the first hour eating and drinking. Those finishing before 1:00 P.M., the scheduled beginning of the rest period, started preparations for their afternoon nap. The rest period ended promptly at 2:00 P.M. An effort by the staff to conduct exercise met with moderate response. The exercises lasted about three minutes and were designed to counter the stiffness and soreness caused by inactivity. The adults seemed sluggish and irritable after the rest period, whereas the children appeared active. One group in Room C sang for a few minutes. At 3:00 P.M., the Ss had a water break and from 3:30 to 4:00 P.M., training

lectures. Concurrent with training was the operation of the nursery. Again, cleaning was sporadic and tended to be done on a room basis. Although there was recreation such as cards and reading, it appeared that the Ss were suffering more from boredom during this period than at any prior time. The noise level was very low during the rest period but rose to a much higher level afterward.

9. Shelter Management Staff Activities--September 11, 1965,  
4:00 P.M.-8:00 P.M.

The management staff was not very active during this period, which was best characterized as a rest period from the chores of supervision.

At 5:10 P.M., the Shelter Manager announced "dinner time," asked the people to return to their sections, and asked for volunteers for the talent show. He was busy again at 6:15 P.M., directing all participants in the talent show to go upstairs.

There were no written records of any of the other staff personnel being active. This development appeared to be normal, since, as the shelter became more organized, it required less staff effort to maintain this organization than to effect initial organization.

10. Shelteree Activities--September 11, 1965, 4:00 P.M.-8:00 P.M.

The Ss' activities during this period fell into the routine pattern of reading, talking, and playing cards. General sanitation was poor. Cleaning activity occurred on an individual rather than a sectional basis. At 5:15 P.M. food and water distribution was started. The stairway was at this time a favorite play area for the children. The adult Ss became irritated by the children's noisy play.

The talent show started at 6:30 P.M. upstairs and was repeated downstairs at 7:22 P.M. Since it proved to be a big morale booster, some of the sheltrees suggested that there be more organized group activities.

During this period the doctor arranged for a small room to be vacated by Ss to accommodate a sick man.

11. Shelter Management Staff Activities-- September 11, 1965,  
8:00 P.M.-12:00 Midnight

This time was not a busy period for the staff. The Director of Operations distributed crackers and carbohydrate supplement to the Section Leaders between 8:00 and 9:00 P.M. The Section Leaders then began their distribution at 9:05 P.M. and completed this task by 9:20 P.M.

12. Shelteree Activities--September 11, 1965, 8:00 P.M.-  
12:00 Midnight

The talent show was still in progress at the beginning of the period. Immediately after the talent show, the shelter became much noisier, and children appeared more restless. There was a water break at 8:10 P.M. Mealtime was shortly after 9:00 P.M. Overall, sanitation was poor with quite a bit of debris on the floor. The only exception was Room A where some general cleaning and straightening occurred. Prior to going to bed, the children were playing and the adults were talking. The Ss began writing diaries about 9:30 P.M. Most of the Ss were sitting quietly and talking or lying down resting when the lights were turned out at 10:00 P.M. The Ss in the upstairs room had prayer recited before turning out lights at 10:10 P.M.

13. Shelter Management Staff Activities--September 12, 1965,  
8:00 A.M.-12:00 Noon

The only announcement was one by the Assistant Shelter Manager, who stated there would be a training lecture on first aid by the doctor.

Between 8:00 and 9:00 A.M. the Section Leaders announced clean-up in their respective sections.

The Medical Area was active even though the physician was busy from 11:00 A.M. to noon with the training lecture.

14. Shelteree Activities--September 12, 1965, 8:00 A.M.-  
12:00 Noon

Aisles were evident during the early part of this time. However, aisles were not formed after the religious service. During the first hour, the Ss had their first meal and started preparation for the religious service. A few Ss rolled up bedding and a few started sweeping.

The Sunday morning religious service was held at 9:00 A.M. At 9:30 A.M., group singing was arranged for children between the ages of five and ten years.

The children, especially the boys between ages eight and twelve, grouped together for games and talking. The adults sat, talked, read, or just relaxed.

The doctor gave a lecture on first aid to the Ss between 11:00 A.M. and noon.

The noise level was quite loud as people began to anticipate release.

15. Shelter Management Staff Activities--September 12, 1965,  
12:00 Noon-4:00 P.M.

At 1:00 P.M., the Section Leaders began distributing the Post-Shelter Questionnaires. The Director of Supply and Maintenance announced that the commodes would be closed at 3:00 P.M. Between 3:00 and 4:00 P.M., the Shelter Manager announced that the Ss should pick up all the paper on the floor and clean the shelter.

16. Shelteree Activities--September 12, 1965, 12:00 Noon-4:00 P.M.

Food and water were distributed at 12:15 P.M. The Ss were busy eating and drinking until approximately 12:45 P.M. From 1:00 P.M. until 1:40 P.M. they were busy filling out the Post-Shelter Questionnaires. They attended a training lecture which began at 1:50 P.M. At 2:15 P.M. they had an afternoon water break. At 3:25 P.M. they started singing. Noise level was high during this period. There was excitement as the Ss prepared for exit.

After the Ss had gathered up their belongings, they used suitcases and rolled-up sleeping bags to delineate family areas. The children stayed close to family groups.

The first exiting S emerged from the shelter at 4:00 P.M.

B. Shelter Diaries

Sheltrees, including children, were asked to fill out the unstructured diaries on both days of confinement. Diary forms were the same as used in ES VII with one modification: a map of the shelter was added in order for the sheltrees to designate their shelter locations. Diaries were grouped according to age and sex. The age group classification used in ES VII was again utilized to facilitate comparisons: 8-16; 17-23; 24-30; 31-40; 41-50; 51-70. There were no diaries in the 1-7 age group. From a total of 300 diaries, 649 comments were scored. Criteria for scoring comments were the same as used in ES VII.

The following tables summarize the data from the different age groups. Table 43 shows the daily percentages of all the positive and negative comments by both males and females. The general increase in both positive and negative comments on the second day of confinement may have several contributory explanations: first, sheltrees could have become more verbose after having had the opportunity to converse with other sheltrees regarding various aspects of shelter living. Second, these diaries were written on the last full day of confinement; the prospect of approaching shelter exit could have imparted a stimulus to greater verbalization.

Table 43  
 Unstructured Diaries--Daily Percentages of Total  
 Positive and Total Negative Comments  
 (ES VIII)

Day	Total		Male		Female		Grand Total	
	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.
Friday, 9/10	40.5	41.2	34.5	52.4	44.0	34.2		
Saturday, 9/11	<u>59.5</u>	<u>58.8</u>	<u>65.5</u>	<u>47.6</u>	<u>56.0</u>	<u>65.8</u>		
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
							50.2	49.8

Figure 11 depicts the percentages of total positive and total negative comments for each day.

Table 44 shows the percentages and frequencies of positive comments made by males and females. The total positive comments are rank ordered in the table. Table 45 is a similar table of negative comments. Note that the total number of scorable comments for each group differs.

Tables C-5 to C-8, Appendix C, summarize the data from the diaries according to age group. Only age groups with an average of ten or more diaries per day are included in these tables. Categories receiving 10% (where 10% represents at least two scores) or more of the scores are listed. Percentages are given to the nearest one per cent.

### 1. Summary of Unstructured Diaries

There was a 1:1 ratio of positive to negative comments in the diaries. Most of the positive comments (approximately one-third) were general remarks (scored "Generally Positive"), whereas most of the negative comments (approximately one-fourth) were complaints about lack of space (see Tables 44 and 45). Percentages of both positive and negative comments increased the second day (see Table 43).

#### a. Food and Water

Comments about food and water were scored in six categories: "Food," "Amount of Food," "Crackers," "Carbohydrate Supplement," "Water," and "Amount of Water." (See Criteria for Scoring Statements in Unstructured Diaries, Appendix C.)

Almost 13% (12.9%) of all positive comments and 16% (16.4%) of all negative comments were scored in these categories. Slightly more of the positive comments were made on the first day, and slightly more of the negative ones on the second day. Both males and females had about the same percentage of positive comments, but the males had a slightly higher percentage of negative comments (approximately 4%). Most of the positive comments were general comments about food (3.4%) whereas most of the negative comments were complaints about the amount of food (4.6%).

#### b. Cups

In ES VII paper cups (and a few replacement styrofoam cups) were used; in ES VII, plastic cups. Approximately 3% of the total negative comments in ES VII were about the cups; there were no positive comments. Most of these comments were made in the first two days' diaries. In ES VIII no comments were made about the cups.

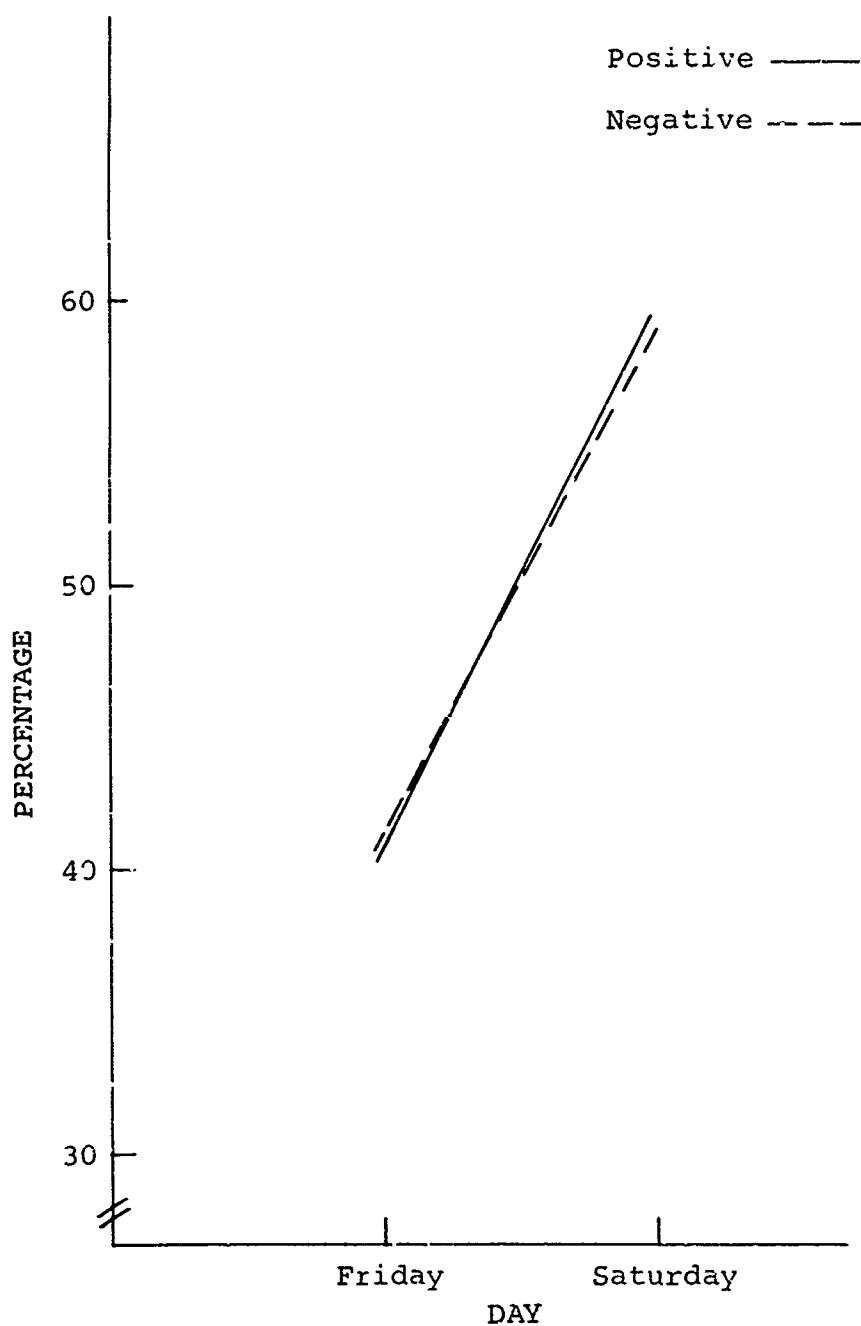


Figure 11. Unstructured Diaries--- Daily percentages of total positive and total negative comments (ES VIII).

Table 44  
 Unstructured Diaries--Positive Comments for  
 Male and Female Shelterees  
 (ES VIII)

Comments	Male		Female		Total	
	Freq.	% <sup>a</sup>	Freq.	%	Freq.	%
Positive	44	37.0	66	31.9	110	33.7
Other People	9	7.6	35	16.9	44	13.5
Recreation	12	10.1	28	13.5	40	12.3
Cooperation	6	5.0	11	5.3	17	5.2
Staff	8	6.7	9	4.3	17	5.2
Food	4	3.4	7	3.4	11	3.4
Children	4	3.4	7	3.4	11	3.4
Physical feeling			9	4.3	10	3.1
Amount food			8	3.9	9	2.8
Organization	6	5.0			9	2.8
Water	6	5.0			8	2.4
Amount water			6	2.9	7	2.1
Things better	6	5.0				
Crackers	3	2.5				
Lectures	3	2.5				
Total scorable comments=119			Total scorable comments=207		Total scorable comments=326	

<sup>a</sup>Only comments with a percentage of 2 or above are included.

Table 45  
 Unstructured Diaries--Negative Comments for  
 Male and Female Shelterees  
 (ES VIII)

Comments	Male		Female		Total	
	Freq.	% <sup>a</sup>	Freq.	%	Freq.	%
Space	30	24.2	47	23.6	77	23.8
Organization	7	5.6	14	7.0	21	6.5
Too hot	13	10.5	6	3.0	19	5.9
Toile†	6	4.8	12	6.1	18	5.6
Amount food	5	4.0	10	5.0	15	4.6
What to bring	3	2.4	11	5.5	14	4.3
Sleeping	5	4.0	9	4.5	14	4.3
Noise	7	5.6	6	3.0	13	4.0
Crackers	4	3.2	8	4.0	12	3.7
Food	5	4.0	6	3.0	11	3.4
Sanitation	4	3.2	6	3.0	10	3.1
Other People			7	3.5	9	2.8
Children			7	3.5	9	2.8
Tired	4	3.2	5	2.5	9	2.8
Amount water	6	4.8			8	2.5
Physical feeling	3	2.4	5	2.5	8	2.5
Negative	4	3.2	4	2.0	8	2.5
Water			4	2.0		
Ventilation			5	2.5		
Time	3	2.4				
			Total scorable comments=124	Total scorable comments=199	Total scorable comments=323	

<sup>a</sup>Only comments with a percentage of 2 or above are included.

c. Sleeping

There were no positive comments made about sleeping. However, 4.3% of all negative comments were about sleeping. Males and females had the same percentages of comments. (See Table 45.)

d. Activities

Approximately 18% of all positive comments were pertinent to activities, i.e., scored in one of seven categories: "Organization," "Activities," "Not Enough Activities," "Recreation," "Exercise," "Vespers," and "Lectures." (See Criteria for Scoring Statements in Unstructured Diaries, Appendix C.) All comments scored "Recreation" were references to the talent show the shelterees organized. Approximately 8% of all the negative comments pertained to in-shelter activities. Whereas both males and females had less than 5% of their positive comments in these categories on the first day, on the second day both had increased their comments to slightly above 25%.

e. People

Over one-fourth (28.8%) of all positive comments made by shelterees were references to other shelterees. Comments were scored in five categories: "Other People," "Sharing," "Co-operation," "Staff," and "Children." (See Criteria for Scoring Statements in Unstructured Diaries, Appendix C.) Most of these comments were scored "Other People." Although few of the ~~negative comments~~ were references to people (6.2%), most of these few were scored "Other People."

2. ES VII and ES VIII

Since ES VII was a seven-day study and ES VIII a two-day study, all comparisons between the two are necessarily qualified. Diaries in ES VII were given on alternate days; diaries in ES VIII on consecutive days. ES VII shelterees writing diaries knew they were to be confined seven days; ES VIII shelterees knew they were to be confined two days. Despite these and other limitations, some general comparisons are indicated.

There was a 2:1 ratio of negative to positive comments in ES VII. This ratio remained constant for each day's diaries. In ES VIII there was a 1:1 ratio. It might be inferred that knowledge of length of confinement tends to bias the shelteree attitudes, i.e., a long confinement tends to produce a negative outlook. In both studies most of the positive comments were general remarks (scored "Generally Positive") or comments about

other sheltrees. Most of the negative comments were complaints about lack of space.

a. Food and Water

Approximately one-fifth (19.7%) of the total positive comments in ES VII were about the stocked food and water. (The percentage is 22.4% if only the first two days' diaries are used.) In ES VIII only one-eighth (12.9%) of the total positive comments were in reference to this.

In ES VII one-third (31.7%) of the negative comments were about the food and water. (The percentage is 26.0% if only the first two days' diaries are used.) In ES VIII one-sixth (16.4%) of all negative comments were in reference to this.

b. Sleeping

In both studies approximately 5% of the total negative comments were about sleeping. There were also about 5% positive comments about sleeping in ES VII. There were no positive comments in ES VIII.

c. Activities

Approximately one-fifth (17.8%) of all positive comments in ES VIII were about activities. (See section entitled "Activities" under Summary of Unstructured Diaries for categories.) Most of these were scored "Recreation." In ES VII 9.3% of the positive comments were about activities. Again most were scored "Recreation." In both studies there were half as many negative comments as positive ones. Of these, most were scored "Organization."

d. People

Over one-fourth (28.8%) of all positive comments in ES VIII and one-fifth (21.1%) in ES VII were references to other sheltrees. About 6% of the comments in both studies were negative. In ES VII most of the negative comments were scored "Children"; in ES VIII, "Other People."

3. Conclusions and Recommendations

- (1) Most of the negative comments in ES VII and ES VIII were complaints about lack of space. Some sheltrees felt they did not have the minimum 10 sq. ft./person. In future studies it seems advisable to give more attention to space utilization.

- (2) Excepting the category "Generally Positive," most of the positive comments in both studies were about fellow sheltrees. Since sheltrees must work as a unit for shelter life to be effective, positive group feelings are essential. Handbook suggestions such as forming an advisory council to represent sheltrees to management, providing a nursery, and giving teen-agers task assignments, may seem unimportant when considered singularly, but when viewed in perspective of the effect on sheltree morale, are essential.

### C. Post-Shelter Questionnaire

The Questionnaire was administered to the shelter population at 1:00 P.M. Sunday, September 12, prior to the conclusion of the study later in the day. Completed Questionnaires from a total of 175 persons (76 males and 99 females) aged eight to sixty-seven form the basis for the following discussion.

#### 1. Adjustment to Shelter Living

Part I of the Questionnaire was an effort to gain an idea of personal adjustment to shelter living. The first question asked each sheltree to estimate the number of additional days he could remain in the shelter with the same conditions existing. Table 46 shows the pattern of responses to this question according to the frequency and percentage of estimates made by males, females, and the total group. The mean estimate for males was 12.3 days (median, 7.3 days); for females, 4.6 days (median, 3.0 days); and for the total group, 8.0 days (median, 4.8 days).

Responses to two further questions indicated that most of the sheltrees felt that shelter life was at least tolerable (see Table 47). Eighty-three per cent said they would have volunteered to stay in the shelter if they had known what it would really be like, and 73% said they would volunteer to stay in the shelter again.

On being asked if there were anything they felt should definitely be added to the shelter stocks, the respondents indicated improved commode facilities.

When the sheltrees were asked what one item they wished they had brought into the shelter with them, food and drink was mentioned by more than one-half of the group. Other frequent comments related to beds and bedding.

Responses to the question asking what items the sheltrees felt they could have left at home were minimal, but articles of clothing were the most frequently mentioned.

Table 46  
 Shelteree Estimates of Tolerance  
 for Continued Confinement  
 (ES VIII)

Additional Days	Number of Estimates		
	Total Group	Males	Females
0-4	77 (46.1%)	21 (28.0%)	56 (60.9%)
5-9	43 (25.7%)	18 (24.0%)	25 (27.2%)
10	12 (7.2%)	7 (9.3%)	5 (5.4%)
15	12 (7.4%)	10 (13.3%)	2 (2.2%)
20	1 (.6%)	1 (1.3%)	0 (0%)
30	<u>22</u> <sup>a</sup> (13.2%)	<u>18</u> (24.0%)	<u>4</u> (4.3%)
Total Responses	167	75	92
Mean Estimate	8.0 days	12.3 days	4.6 days
Median Estimate <sup>b</sup>	4.8 days	7.3 days	3.0 days

<sup>a</sup>One-half of the 30-additional-day estimates came from persons over 30 years of age.

<sup>b</sup>This figure is more representative of the shelterees' estimates.

Table 47

Shelteree Evaluation of  
Shelter Adjustment  
(ES VIII)

Question	Per Cent Yes		
	Total Group	Males	Females
Would you have volunteered to stay in the shelter if you had known what it would really be like?	83 (N=144)	85 (N=64)	82 (N=80)
Would you volunteer to stay in this shelter again sometime?	73 (N=129)	80 (N=57)	69 (N=72)

Upon being asked what items they had brought into the shelter were most helpful, the shelterees cited primarily bedding and food supplies. Bedding was mentioned nearly twice as often as food, whereas in answer to the earlier question about items they wished they had brought with them, the frequency of comments on food and bedding was reversed.

Another question sought to ascertain what supplies the shelterees would carry into the shelter in event of war. Their answers were quite similar to their responses when asked what they wished they had brought with them: food and bedding. Food was mentioned twice as often as bedding.

## 2. Primary Discomfort Factors

Part II of the Questionnaire sought to determine the principal factors causing discomfort to the shelter population. A list of 18 factors was provided, and the group was asked to cite those factors which were bothersome and then to rank the cited items according to primacy of discomfort. While most of the respondents indicated the factors bothersome to them, too few cooperated with the ranking procedure to merit consideration in this discussion. The frequency of selection and the percentage of persons making each selection are presented in Table 48.

There were five principal discomfort factors, i.e., five items cited by one-third or more of the respondent group. These factors and the percentage of persons who chose them were: no bathing (61%), toilets (55%), space (54%), too warm (48%), and dirty (37%).

"No Bathing" was indicated as a discomfort to the extent that it became the primary complaint. Having to wear the same clothes and being unable to wash hands and face were items cited as the major reasons the lack of bathing facilities was so keenly felt. By far the largest number of registered complaints was related to various aspects of cleanliness in the shelter.

"Toilets" was the second most frequently mentioned discomfort factor. Associated with this problem were problems of odor, too few toilets for the size of the group, and a sense of uncleanliness. Sixty-two per cent of the group indicated that the toilets were the predominant sanitation problem. With regard to the feeling that there were not enough toilets for the group, it is of significance that only one toilet area, i.e., one for females and one for males, was provided by the shelter management. This was located on the first floor of the shelter; and the area on the second floor of the shelter, which was intended to be used for toilets, was used as additional general living space.

Table 48

**Shelteree Indications of Discomfort  
(ES VIII)**

Item	Age					Total Group (N=175)
	8-16 (N=22)	17-23 (N=30)	24-30 (N=37)	31-40 (N=45)	41-50 (N=28)	
No bathing	50% (11)	70% (21)	57% (21)	73% (33)	54% (15)	46% (6) 61% (107)
Toilets	59% (13)	57% (17)	57% (21)	49% (22)	61% (17)	46% (6) 55% (96)
Space	64% (14)	70% (21)	54% (20)	51% (23)	43% (12)	38% (5) 54% (95)
Too warm	59% (13)	57% (17)	49% (18)	42% (19)	46% (13)	31% (4) 48% (84)
Dirty	36% (8)	40% (12)	43% (16)	36% (16)	32% (9)	23% (3) 37% (64)
Water	50% (11)	37% (11)	27% (10)	36% (16)	14% (4)	15% (2) 31% (54)
Smells	32% (7)	33% (10)	19% (7)	36% (16)	36% (10)	23% (3) 30% (53)
Noise	41% (9)	37% (11)	38% (14)	31% (14)	18% (5)	0 (0) 30% (53)
Shelter crackers	73% (16)	40% (12)	27% (10)	22% (10)	11% (3)	0 (0) 29% (51)
Not enough fresh air	36% (8)	30% (9)	24% (9)	22% (10)	25% (7)	8% (1) 25% (44)
No coffee	9% (2)	13% (4)	30% (11)	31% (14)	25% (7)	38% (5) 25% (43)
Couldn't sleep	27% (6)	37% (11)	22% (8)	18% (8)	14% (4)	0 (0) 21% (37)
Boredom	36% (8)	40% (12)	22% (8)	9% (4)	11% (3)	8% (1) 21% (36)
Too cool	9% (2)	20% (6)	3% (1)	13% (6)	7% (2)	8% (1) 10% (18)
Other people	9% (2)	20% (6)	14% (5)	4% (2)	4% (1)	0 (0) 9% (16)
Shelter activities	5% (1)	7% (2)	8% (3)	7% (3)	7% (2)	0 (0) 6% (11)
Tobacco smoke	0 (0)	10% (3)	3% (1)	7% (3)	4% (1)	0 (0) 5% (8)
Not enough tobacco	0 (0)	7% (2)	3% (1)	2% (1)	0 (0)	0 (0) 2% (4)

"Space" ranked third in the order of reported discomforts. Several factors seemed to aggravate this as a problem. In the first place, air mattresses, bedding, or personal belongings were not stored during the day. Also, the usual problem incurred by large amounts of bedding and other personally supplied items was evident: these things took up more space than was intended for each person.

"Too Warm" was cited as a discomfort by more than one-third of the group who completed the Questionnaire. The outside temperature during the study and the extremely close quarters and crowding obviously contributed to this as a discomfort.

"Dirty" ranked fifth in the order of major discomforts in ES VIII. This reinforces the more frequently indicated discomforts of "no bathing" and "toilets."

Other questions sought to establish the sheltrees' feelings about additional aspects of confinement. The significance of responses to them follows.

Sanitation emerged as the largest single concern of the group. Continued reference was made to the unclean toilets, the odor from the toilets, the lack of a change of clothes, and the absence of washing facilities. Forty per cent of the group completing the Questionnaire complained of headaches, and this was the dominant physical problem. Crowded conditions, the temperature, uncomfortable sleeping arrangements, and an immediate change in diet habits were probably accumulative causes of this physical reaction to the environment. Sleeping was difficult because of the hard floor, which also made parts of the body sore.

A number of different questions sought to elicit the sheltrees' feelings about shelter food. They were given several opportunities to complain about the food per se, but none of the complaints registered about the food were numerous enough to involve one-third or more of the responses. However, 36% of the group indicated that they wished they had brought more food with them; 67% reported that they did bring some food supplies into the shelter. Sixty-two per cent of the respondents reported that someone shared food with them. Sixty-nine per cent complained that the directions about bringing food were unclear. Thirty-eight per cent of the group reported that people should be allowed to keep food for their own use or disposal as they deemed wise.

Other questions sought to determine exactly what kinds of food were brought into the shelter, what was shared with others, and what kinds of food the sheltrees would bring with them if they had to take shelter at a later time. Four basic types of food were mentioned in response to all these questions: canned foods, dry foods (crackers, bread, dry milk, cheese), candy, and

beverages. However, only one person reported that a liquid had been shared. It would appear that the sheltrees deemed liquids more for personal or family consumption, and if they shared food at all with others, it was likely to be things other than liquids.

Questions pertaining to factors such as shelter management, activities, food, other people, exercise, and training sessions merited quite low evaluative comment. In addition, open-ended questions providing the group opportunity to comment generally on their experiences during confinement merited low response.

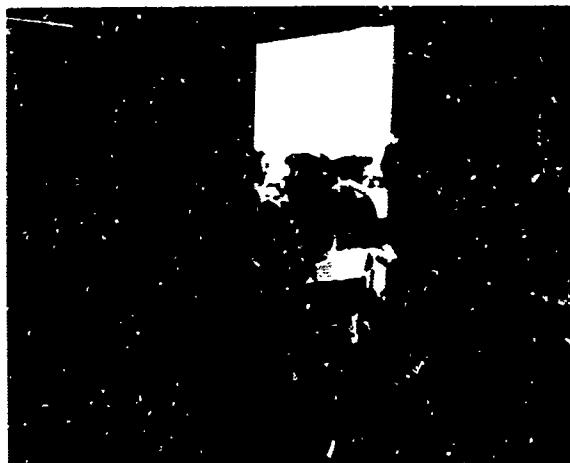
### 3. Conclusions

- (1) After approximately forty hours in confinement, those sheltrees completing the Post-Shelter Questionnaire estimated that they could endure an average of eight additional days (median, 4.8 additional days) under the same conditions.
- (2) A majority (more than four-fifths) of the sheltrees completing the Questionnaire reported that more complete knowledge of shelter conditions would not have affected their decision to undergo confinement. Almost three-fourths of the group reported that they would stay in the same shelter again sometime.
- (3) Though they were allowed to bring with them items they considered necessary for survival, food and drink and beds and bedding comprised the great majority of items they wished they had brought with them.
- (4) The sheltrees deemed toilet facilities to be the aspect of shelter living in greatest need of further attention and improvement.
- (5) Five areas of discomfort were cited by one-third or more of the sheltrees completing the Questionnaire. These, in order of frequency of mention, were: no bathing, toilets, space, too warm, and dirty. Responses to other Questionnaire items indicated a focused concern over toilet facilities and sanitation.

### V. Defections

A total of eight sheltrees left the shelter before the scheduled exit. Sheltrees who left the shelter on advice from the medical staff were termed "medical" defectees, whereas those who left without medical advice were classified as "non-medical" defectees. Of the eight defections in ES VIII, three were medical. Three of the remaining five were not bona fide defections in the sense that their only reason for leaving

was to accompany a sick family member. The other two couldn't adapt to the shelter situation and were so uncomfortable that they left before the scheduled exit time. An outline of departure times, sheltrees exiting, and reasons for leaving is presented in Table 49.



The first sheltrees to leave made their exit at 2:00 P.M. on Saturday, September 11. A 37-year-old female complained of pain in joints caused by sleeping on the hard floor, and a 16-year-old male left because of general discomfort. At 3:20 P.M. the same day, an 18-year-old female defected because of low blood pressure and nervousness and her 26-year-old husband left to take her home. The fifth defection of the day occurred when a 15-year-old female left because of inability to eat or sleep.

Early Sunday morning, 12:45 A.M. September 12, three members of the same family defected, bringing the total to eight. A 45-year-old female suffered excessive vaginal bleeding and her 40-year-old husband and 10-year-old daughter left to accompany her.

No further sheltrees made interim exits and all remaining were apparently in good health and spirits on Sunday afternoon at 4:00 P.M., when the weekend occupancy test was concluded.

#### Conclusions and Recommendations

1. Five females and three males defected during ES VIII.
2. Eighteen per cent of defections in ES VII were for medical reasons and 37.5 in ES VIII were of this nature.
3. No one over 47 years of age defected in either study.
4. On the second day of ES VII, the 7-day study, the greatest number of defections (24) occurred.

Table 49

**Nature of Defects  
(ES VIII)**

Date	Time	Age	Sex	Reason for Exit
Saturday September 11	2:00 P.M.	37	F	Pain in joints caused by sleeping on hard floors
	2:00 P.M.	16	M	General discomfort
	3:20 P.M.	18	F	Low blood pressure, nervousness
	3:20 P.M.	26	M	Took wife home
	3:50 P.M.	15	F	Couldn't sleep or eat
Sunday September 12	12:45 A.M.	45	F	Excessive vaginal bleeding <sup>a</sup>
	1:245 A.M.	40	M	Took wife home
	12:45 A.M.	10	F	Left with parents

<sup>a</sup>Medical defections.

## Chapter 21 - Environmental Variables

### I. Temperature and Ventilation

Each day, the dry bulb temperature both inside and outside the shelter increased to a maximum level which was usually attained in the early afternoon, and then dropped again in the evenings. During the early morning hours and late afternoon hours the inside temperature was slightly higher than the outside temperature, but during the hotter portions of the day, the reverse was true. (See Tables 50-52.) Each day, the inside wet bulb temperature also followed this trend. (See Figures D-8 to D-10, Appendix D.)

During the entry phase on Friday the outside wet bulb temperature dropped only slightly, whereas the inside wet bulb temperature increased from 73.9°F at 4:00 P.M. to a maximum of 80.1°F at 6:00 P.M. At 6:30 P.M. the fans were turned to Condition 6, and by 7:00 P.M. the wet bulb temperature dropped to 75.1°F and remained fairly constant. (See Table 53.)

The Temperature-Humidity Index (THI) inside the shelter was almost the same as outside, except for the entry phase on Friday, during which the THI inside the shelter was higher than that outside. (See Tables 51 and 54.)

During the study, the overall mean Temperature-Humidity Index (computed on the power psychrometer readings), was 78.4°F, with the lowest mean index being 78.1°F on 12 September, and the highest mean index being 79.0°F on 11 September.

These results indicate that, during shelter entry, time must be allowed for an equilibrium of environmental and shelter temperatures. In ES VII the results indicated that the ventilation equipment was adequate for the shelter, while in ES VIII less ventilation equipment was utilized and use was made of more natural ventilation (see Table 55).

In ES VIII the THI meters were not used since data from ES VII showed the meters did not respond rapidly to temperature and/or humidity changes. Temperature data from the power psychrometers were more reliable in ES VIII than in ES VII since sufficient time was allotted for equilibrium of the dry and wet bulb temperatures.

### II. Emergency Operating Center

The results of the initial EOC program were encouraging in many respects. The EOC phone messages were generally factual and business-like, and did not include "panic-type" emergency bulletins. Since the messages were business-like, they were accepted in the same manner by

Table 50

Dry Bulb Temperature (°F)  
(ES VIII)

Location of Reading	Instru- ment Used <sup>a</sup>	Sept. 10			Sept. 11			Sept. 12					
		Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.
Outside	P. Psy.	85.0	73.0	77.1	4.2	88.0	71.0	78.6	5.0	86.0	73.0	78.1	3.8
Room A	P. Psy.	84.0	79.0	81.3	1.9	86.0	77.0	82.4	2.8	84.8	79.0	81.7	2.1
	Therm.	82.0	76.0	77.9	1.8	86.0	75.5	79.7	3.3	84.0	76.0	79.0	2.6
Room B	P. Psy.	84.0	79.0	81.1	2.0	86.0	77.5	83.3	2.4	85.6	80.0	82.8	2.0
	Therm.	81.0	76.0	78.4	1.4	84.5	75.9	79.8	2.8	85.0	77.5	80.3	2.4
Room C	P. Psy.	84.5	81.5	82.6	1.3	87.0	78.5	83.8	2.3	86.7	81.0	83.0	2.1
	Therm.	80.0	76.0	77.2	1.2	84.0	71.0	78.2	2.4	83.0	76.0	78.9	2.0
Room D	P. Psy	85.0	79.5	81.8	2.1	86.0	78.5	83.3	2.4	86.0	80.0	83.3	1.7
	Therm.	82.0	78.5	79.9	1.1	84.0	77.5	81.1	2.0	84.5	78.0	80.6	2.0

<sup>a</sup>Instruments used are abbreviated as follows:

- 1) P. Psy.: Power Psychrometer  
2) Therm.: Thermistor

Table 51 (Contd.)

Table 51  
 THI and Dry Bulb Temperatures  
 (Average for all four rooms and outside by  
 date and instrument in °F)  
 'ES VIII)

Time	THI			Dry Bulb		
	Outside		Inside	Outside		Inside
	Power	Psychrometer	Therm-	Power	Psychrometer	Therm-
September 10, 1965						
4:00 P.M.	79.0	77.6	76.3	85.0	82.1	78.7
5:00	78.9	79.7	77.1	84.0	84.0	79.0
6:00	74.9	80.7	79.5	76.0	63.9	81.3
7:00	75.0	77.2	76.6	76.5	80.4	78.0
8:00	74.7	76.9	76.7	76.0	79.5	78.6
9:00	74.7	76.9	75.7	76.0	79.9	77.9
10:00	74.2	--a	76.1	73.5	--	78.0
11:00	73.0	--	75.4	73.5	--	77.1
12:00	72.7	--	75.4	73.0	--	76.8

(Contd.)

Time	TII			Dry Bulb		
	Outside		Inside	Outside		Inside
	Power	Psychrometer	Therm-	Power	Psychrometer	Therm-
September 11, 1965						
1:00 A.M.	72.3	—	75.4	72.0	—	76.4
2:00	71.5	—	75.3	71.0	—	76.6
3:00	72.1	—	74.9	72.0	—	76.6
4:00	72.1	—	75.2	72.0	—	76.7
5:00	72.9	—	75.2	73.5	—	76.7
6:00	73.2	—	75.6	74.0	—	77.1
7:00	73.2	75.7	75.5	73.5	77.9	77.3
8:00	74.8	76.5	76.8	76.5	79.1	78.5
9:00	75.0	77.4	76.8	76.0	80.3	78.5
10:00	76.7	78.3	77.2	79.0	82.0	79.0
11:00	76.2	79.0	77.9	78.8	83.2	79.7
12:00	79.0	79.1	78.2	84.0	83.5	81.1
1:00 P.M.	79.0	79.3	78.3	84.0	84.1	81.7
2:00	83.0	81.3	78.4	85.5	85.9	81.6
3:00	82.5	80.8	79.9	87.0	86.0	83.7
4:00	81.5	80.5	79.9	88.0	85.9	83.0
5:00	79.9	80.2	79.7	85.5	86.0	83.4
6:00	77.4	79.1	79.9	81.0	84.6	84.0
7:00	77.2	79.7	78.9	80.0	84.1	81.9
8:00	76.8	79.1	79.4	79.5	82.8	82.3
9:00	77.1	78.8	78.9	79.5	82.5	81.3
10:00	76.5	—	78.3	78.0	—	80.5
11:00	76.2	—	78.0	78.0	—	80.3
12:00	75.4	—	77.0	77.5	—	79.3

(Contd.)

Table 51 (Contd.)

Time	THI						Dry Bulb		
	Outside		Inside		Outside		Inside		
	Power Psychrometer	Power Psychrometer	Theirm- istors	Theirm- istors	Power Psychrometer	Power Psychrometer	Therm- istors	Therm- istors	
September 12, 1965									
1:00 A.M.	74.7	--	76.6	76.0	--	--	78.8		
2:00	74.7	--	76.2	76.0	--	--	78.4		
3:00	74.4	--	76.3	75.5	--	--	78.4		
4:00	74.3	--	75.7	75.0	--	--	77.8		
5:00	74.3	--	75.7	75.0	--	--	77.1		
6:00	73.1	--	75.7	73.0	--	--	77.2		
7:00	74.0	--	75.6	74.5	--	--	77.4		
8:00	75.8	76.9	77.2	78.0	80.0	80.0	78.8		
9:00	76.0	77.2	77.9	78.5	81.0	81.0	80.2		
10:00	75.8	77.5	77.7	78.5	81.8	81.8	80.7		
11:00	77.0	78.3	78.2	81.0	83.3	83.3	80.6		
12:00	77.5	78.4	78.6	82.0	83.7	83.7	81.6		
1:00 P.M.	78.9	78.6	78.7	84.8	83.4	83.4	81.6		
2:00	80.0	79.7	79.2	86.0	85.8	85.8	83.5		
3:00	--	--	79.9	--	--	--	84.1		

aNot recorded--Sheltersees sleeping.

Table 52

Selected Sample of Dry Bulk Temperatures  
(ES VIII)

Date and Time	Temperature Outside Shelter (°F)	U. S. Weather Bureau Airport Temperature (°F)
<b>September 10:</b>		
3:00 P.M.		88.0
4:00	85.0	87.2
5:00	84.0	87.0
6:00	76.0	75.8
7:00	76.5	74.0
8:00	76.0	73.0
9:00	76.0	71.0
10:00	73.5	71.0
11:00	73.5	71.0
12:00 P.M.	73.0	70.0
<b>September 11:</b>		
2:00 A.M.	71.0	68.9
4:00	72.0	69.2
6:00	74.0	70.0
8:00	76.5	71.8
10:00	79.0	76.2
12:00	84.0	80.1
2:00 P.M.	85.5	83.0
4:00	88.0	85.0
6:00	81.0	82.3
8:00	79.5	77.0
10:00	78.0	76.0
12:00 P.M.	77.5	75.0
<b>September 12:</b>		
2:00 A.M.	76.0	75.0
4:00	75.0	73.0
6:00	73.0	72.5
8:00	78.0	74.8
10:00	78.5	77.2
12:00	82.0	82.0
2:00 P.M.	86.0	84.3
3:00	-- <sup>a</sup>	85.1
4:00 P.M.	--	78.8

<sup>a</sup>Not recorded--Shelter exit in process.

Table 53

Wet Bulb Temperature ( $^{\circ}$ F)  
(ES VIII)

Location of Reading	Instru- ment Used <sup>a</sup>	Sept. 10			Sept. 11			Sept. 12					
		Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	Mean	S.D.
Outside	P. Psy.	75.5	71.0	73.3	1.4	84.5	70.0	74.6	3.4	76.0	72.0	73.6	1.0
Room A	P. Psy. Therm.	79.5 80.0	70.0 73.0	75.2 75.7	2.9 2.0	78.0 80.0	73.5 72.0	75.9 75.8	1.2 2.5	75.0 78.0	74.0 72.5	74.4 75.4	0.4 2.0
Room B	P. Psy. Therm.	79.0 79.0	74.0 72.5	75.4 75.2	1.7 1.9	78.0 80.8	73.5 74.0	76.5 76.4	1.1 1.9	75.5 77.5	74.0 73.5	74.7 75.2	0.5 1.3
Room C	P. Psy. Therm.	81.0 78.0	75.5 73.0	77.4 74.9	2.0 1.8	80.5 80.0	74.0 72.0	77.1 75.5	1.5 2.4	77.0 78.5	74.5 73.0	75.3 75.5	0.8 2.0
Room D	P. Psy. Therm.	81.0 81.0	74.0 75.0	75.9 76.3	2.5 1.8	83.5 79.0	71.5 74.0	76.2 76.5	2.5 1.1	76.0 79.5	74.5 74.5	75.1 77.3	0.6 1.5

<sup>a</sup>Instruments used are abbreviated as follows:

- 1) P. Psy.: Power Psychrometer
- 2) Therm.: Thermistor

Table 54

Temperature-Humidity Index ( $^{\circ}\text{F}$ )  
(ES VIII)

Location	Instrument of Reading	Instru- ment Used <sup>a</sup>	Sept. 10			Sept. 11			Sept. 12			
			Max.	Min.	S.D.	Max.	Min.	Mean	S.D.	Max.	Min.	
Outside	P. Psy.	79.0	72.7	75.2	2.1	83.0	71.5	76.3	3.2	80.0	73.1	
	Rcom A	P. Psy. Therm.	80.0 80.0	75.9 75.0	77.7 76.1	1.5 1.5	80.3 80.8	75.3 74.3	78.4 77.3	1.6 2.2	79.0 79.7	76.2 74.5
Room B	P. Psy.	80.0	76.2	77.7	1.5	80.6	75.5	79.1	1.4	79.5	76.9	78.1
	Room C	P. Psy. Therm.	79.1 78.4	74.9 74.9	76.5 75.9	1.3 1.1	80.9 79.8	75.0 74.3	77.6 76.7	1.8 1.7	80.1 79.1	75.6 75.0
Room D	P. Psy.	81.3	77.9	79.1	1.3	81.8	76.0	79.5	1.5	80.5	77.2	78.4
		Therm.	80.5	76.5	77.6	1.2	80.4	76.0	78.2	1.2	80.5	76.5

<sup>a</sup>Instruments used are abbreviated as follows:

- 1) P. Psy.: Power Psychrometer
- 2) Therm.: Thermistor

Table 55

Ventilation Conditions  
(ES VIII)

Condition	Description
1	During day when hot and early morning: 3 Observation area fans - On exhaust <sup>a</sup> 5 In-shelter fans - On intake <sup>a</sup> (High)
2	During evening - 6 P.M. to 11 P.M.: 3 Observation area fans - On 5 In-shelter fans - On (Medium)
3	When humidity is high outside or during night and moderate temperature: 3 Observation area fans - On 5 In-shelter fans - Off
4	During night and when cool: 1st floor attic fan - On 2nd floor attic fan - On 4th floor attic fan - Off 5 In-shelter fans - Off
5	During night and when cold - 12 P.M. to 6 A.M.: 3 Observation area fans - Off 5 In-shelter fans - Off
6	During early evening and late at night (warm temperatures): 1st floor attic fan - Off 2nd floor attic fan - Off 4th floor attic fan - On 5 In-shelter fans - On
7	During day for circulation of air: 3 Observation area fans - Off 5 In-shelter fans - On

<sup>a</sup>Observation area fans were always on exhaust; in-shelter fans were always on intake.

the Communications Man and the rest of the shelteree staff. The Communications Man seemed to take the EOC program seriously and performed well in answering questions (see Appendix F).

In ES VIII, one of the problems of concern to the experimenters was whether the in-shelter phone would even be answered when it rang. The first attempt to call the shelter was made at 4:30 P.M., only eight minutes after shelter entry began (at this time there were about 60 people in the shelter), but the phone was not answered. On the second attempt (at 4:35 P.M.) the phone was answered by the Director of Operations, who said a Communications Man had not been appointed. Five minutes later, EOC again called the shelter and this time the Communications Man (a female) had been appointed. She was given the eight questions to be answered in the first message. Thus, within 15 minutes of the time the first people entered the shelter, 17 out of 20 job leaflets had been passed out (Communications Man is No. 17), and shelter organization started.

Three other problems directly or indirectly connected with EOC were the deliberate stocking of 36 empty water drums, locating 5 boxes of carbohydrate supplement in Room D away from the other food and shelter supplies, and overloading the shelter. The reactions of the shelteree staff to these problems were clearly communicated to EOC. The Communications Man called EOC to ask if there was another shelter to which some people could be sent, and later to ask if the empty water drums could be moved out. When the shelteree staff learned that EOC would not help them solve these problems, they used their own ingenuity to solve them.

#### Recommendations

Some type of EOC program should be implemented in all future occupancy studies. More elaborate EOC programs could be designed for simultaneous shelter occupancy studies using two, three, or more shelters. Several types of simulated problems could be introduced, such as food or water shortages, fires, power failures, or overcrowding. Since many shelters may be without communication or power, a one-way EOC system is needed, whereby EOC radio broadcasts could instruct people in shelters as a supplement to the Handbook.

### III. Shelter Supplies

#### A. Sanitation Kit IV

The sanitation kit stocked in the shelter for ES VIII was the older type, which has hand cleaner, plastic cups, and the short siphon hose. As in ES VII, supplies in the sanitation kits were used excessively, indicating poor control by the shelteree staff. In only two days, more than one-half of the hand cleaner, one-third of

the toilet tissue, one-third of the sanitary napkins, and five-sixths of the plastic cups were used. (See Table 58 for exact amounts.)

In both ES VII and ES VIII, the Post-Shelter Questionnaire revealed toilet odors to rank among the top discomforts. In ES VII, there were 74% negative comments on toilets, while in ES VIII there were 55% negative comments. (For further details, see the Post-Shelter Questionnaire write-up.) The reason for the decline in negative comments in ES VIII was probably due to the fact that ES VIII was only a 48-hour study, while ES VII was a one-week study, and odors would tend to become more intense over the longer time period.

#### Conclusions for ES VII and ES VIII

1. Toilet tissue was used excessively. The supply stocked would not have been sufficient for a two-week shelter stay at the going rate of use.
2. The stocked paper cups in ES VII were not substantial enough for the rigors of shelter living.
3. The additional length of the siphon hose was helpful in ES VII, but a siphoning problem still existed.
4. No bag liner leakage was reported in ES VII, and only one was reported in ES VIII.
5. There continues to be a need for greater emphasis on sanitation procedures.

#### B. Medical Kit C

Medical Kit C used in ES VIII was identical to that stocked in ES VII, and the same commentary applies here.

An inventory of expended items is given in Table 56.

#### C. Food and Water

Of the stocked Civil Defense food supplies, the sheltrees consumed approximately 1/4 lb. crackers/person/day and 1/12 lb. carbohydrate supplement/person/day, or a total of approximately 655 calories/person/day (Table 57). As already discussed, 71.0% of the sheltrees brought in some type of food adjunct. The presence of these food adjuncts precludes a precise computation of caloric intake.

The sheltrees consumed the stocked water at a rate of approximately 3/4 qt./person/day. However, 15.6% of the sheltrees brought water with them into the shelter.

Table 56  
Medical Kit C Provisions  
(ES VIII)

Item	Stocked	Used
Scissors	3	1
Kaolin and Pectin Mixture	15	1
Isopropyl Alcohol	5	1/5 can
Penicillin G Tablets	12	1/2 bottle (41 of 100 tablets)
Water Purification tablets	2 packages of 6 bottles	1/2 package (3 bottles)
Syringe, Fountain	1	0
Sodium Bicarbonate	2 lb. bottles	2 tablespoons approx.
Bandage, Gauze, 12's	6 boxes of	1/6 box (2 rolls)
Roller, 2 in. by 6 yd.	12's	
Eye and Nose drops 1/2 fl. oz.	17 packages	1 package
Sodium Chloride 1 lb. bottles	2 bottles	1/3 bottle
Cascara Sagrada Extract tabl. 4 gr. 100's	6 bottles	0
Eugenol 1 oz. bottle	1	0
Petroleum White 1 lb. cans	3 cans	0
Bandage, Muslin, Compressed, Camouflaged 37 x 37 x 52 in.	6	0
Soap, Surgical 1 3/4 oz. with 5% hexachl.	36 cakes	2 cakes
Sulfadiazine tablets 7 1/2 gr. 1000's	3 bottles	0
Phenobarbital tablets 1/2 gr. 1000's	3 bottles	1/8 bottle (68 from 1 and 92 from another)
Aspirin tablets 5 gr. 1000's	3 bottles	1/5 bottle (16 from 1 and 167 from another)
Pin, safety 1 1/2 in. 12's	9	0
Cotton, Purified 1 lb.	2	0
Pad, gauze, surgical 4 x 4 in. 200's	4 packages	0
Applicator, wood cotton tipped end 1/2 by 6" 100's	5 packages	1/20 of 1 package (5 applicators)
Depressor tongue, wood, 100's	3 packages	1 package
Forceps, dressing 3 1/2 in.	1	0
Thermometer Clinical, human, oral, or rectal	4	0
Publication: <u>Medical Care in Shelters</u>	1	1

Table 57

Food and Water Consumption<sup>a</sup>  
(ES VIII)

Item	Total Consumed	Consumed/ Person/Day
Crackers	154 lbs.	0.24 lb.
Carbohydrate	52.50 lbs.	0.08 lb.
Water	506.80 qts.	0.80 qt.

aSs were allowed to bring additional supplies.

D. Inventory of Shelter Provisions

An inventory of expended shelter supplies is presented in Table 58.

E. Additional Sanitation Supplies

Two of the four stocked mops were used, all four of the brooms were used, and all of the rags were used. The opinion of most of the observers was that the sheltrees knew they would only be in the shelter for two days, and thus did not bother to clean up the shelter very frequently.

Table 58

OCD Shelter Provisions<sup>a</sup>  
(ES VIII)

Item	Stocked	Used	Unused
Crackers (6 tin/box; 7 lb./tin)			
boxes	24	3.67	20.33
lb.	1008	154	854
Carbohydrate Supplement (2 tin/box; 35 lb./tin)			
boxes	8	0.75	7.25
lb.	560	52.5	507.5
Water (17.5 gal./drum)			
drums	24	7.24	16.76
gal.	420	126.7	293.3
Radiological Kit	1	1	--
Extra Radiological Meters	1	1	--
Sanitation Kit:			
Toilet Tissue (rolls)	60	21	39
Drum, fiber	6	6	0
Seat commode	6	6	0
Can opener	6	2	4
Sanitary Napkins	360	98	262
Gloves, polyethylene (pairs)	6	4	2
Spout (Siphon hose)	6	3	3
Tie wire	6	4	2
Cups (80/SK)	480	400	80
Cup lids (80/SK)	480	280	200
Commode chemical	6	6	0
Bag, polyethylene	6	6	0
Hand cleaner (cans)	6	3 1/3	2 2/3
Instruction sheet	6	6	0
ADDITIONAL SUPPLIES:			
Fire extinguishers	6	---	6
Bible	1	1	--
Mops	4	4	--
Brooms	4	4	--
Rags, lbs.	4	4	--
<u>Shelter Handbook</u>	1	1	--
<u>Guide to Shelter Living and Training</u>	1	1	--

<sup>a</sup>Medical Kit items given in Table 56.

## I. Pre-Shelter Evaluation

### A. Conclusions

1. Shelters, ranging in age from 1-70 years, appeared similar to the general population with respect to social, economic, and educational characteristics. The median income and occupational levels were slightly higher for ES VIII than for ES VII.
2. Prior to each study, applicants were screened by a Medical History Questionnaire. No shelteree was rejected on the basis of the medical examination that was given on the day of entry.
3. The majority of subjects in both studies were not adequately prepared for either natural or nuclear emergencies.
4. The most frequently listed personal possessions brought into the shelter included recreational items (books, cards), toilet articles (toothbrush, comb, deodorant), bedding (sleeping bags, blankets, pillows), and extra clothing (underwear, coat/sweater). Some shelterees brought food, candy, cookies, and chewing gum. Others brought additional water.
5. Personality characteristics measured by the Leadership Subscale of the Minnesota Multiphasic Personality Inventory given in ES VIII proved to be valid predictors of emergent leadership.

### B. Recommendations

1. Public educational programs designed to inform the general public of necessary emergency preparations, including personal supplies that are most useful in community shelters, should be developed and tested.
2. The survival needs of infants below the age of one year should be investigated.
3. Needs of the elderly (over 70) should be studied, as well as those of institutional populations.
4. Validated items from the Shelteree Information sheet should be used for the selection of the most qualified persons within a shelter for management. Selected questions from the MMPI Leadership Subscale should be further investigated for this purpose.

## II. Shelter Handbook and Shelter Staff Organization

### A. Conclusions

1. A brief pre-shelter orientation address proved helpful for entry phase organization and has implications for mass media Civil Defense instruction.
2. The management staff organization proposed in the permanent phase of the Handbook is sufficient for a 300-person shelter group.
3. The Handbook suggestion of an alternate staff was judged to be an effective method of providing needed relief from the responsibilities of management.
4. The method of distributing Section Leader leaflets was difficult to implement and was a cause of inefficient section formation in both studies.
5. Tables added in the ES VIII Handbook improved calculations of food and water rations.
6. Revised instructions in the ES VIII Handbook for the Radio-logical Monitor were easier for the untrained monitor to understand.
7. Sections that were formed in both studies tended to follow the physical arrangements of the shelter area. Room groups, rather than the Handbook-stipulated sections of 25-30 persons, were formed.
8. The method of selecting the permanent shelteree staff proved satisfactory in both studies.
9. The triumvirate temporary Shelter Manager procedure appeared to be more effective than a singular manager approach in initiating the temporary phase.

### B. Recommendations

1. The use of multiple temporary Shelter Managers during the entry phase should be further tested.
2. New methods of shelter staff organization during the entry phase should be evaluated, e.g., section formation after all sheltrees have entered.
3. Sanitation instructions must emphasize the health hazards which result from improper sanitation. This information should be conveyed to all sheltrees.

4. Simulated Emergency Operating Center programs, such as that initiated in ES VIII, should be continued.
5. The permanent shelter management staff organization proposed in the Handbook should be adopted for the 300-person shelter population.
6. Management structure for shelter configurations larger than 300 persons should be developed and tested.

### III. Shelter Activities

#### A. General

##### 1. Conclusions

- a. In-shelter training, recreation, exercise, and religious services can be successfully conducted by untrained persons using Handbook material.
- b. Departures from Handbook recommendations concerning activities were based in large part on implementation of some activities before portions of the Handbook were read, failure to read some sections, and problems in reading and comprehending instructions.
- c. Space utilization was poor. Some sections were more crowded than others, and very few aisles were formed.

##### 2. Recommendation

Space utilization problems, i.e., storage of bulky personal items of bedding, equitable allocation of space, and appropriate aisles, need further attention during shelter habitation.

#### B. Training

##### 1. Conclusions

- a. CDR Handbook training materials proved helpful in the daily lectures.
- b. Floor by floor lecture presentation appeared to be a more effective means of communication than a centralized lecture delivered to the total population.

## 2. Recommendations

- a. Lectures should be adapted to small groups within the shelter configuration in order to assure better attention, comprehension, and discussion.
- b. Additional post-attack in-shelter training materials should be developed and tested, e.g., decontamination procedures, and emergency communications systems.

## C. Exercise

### 1. Conclusion

Some of the exercises used in the one-week test were too strenuous for females and older males. The Handbook suggestions were not followed in this regard. In the weekend test, exercise for the most part was ignored.

### 2. Recommendation

The Handbook exercises, suitable to all ages, should be followed.

## D. Recreation

### 1. Conclusion

Organized daily shelter-wide recreation was well received.

### 2. Recommendation

Organized shelter recreational programs should be used as a means of improving shelter morale.

## E. Nursery

### 1. Conclusions

- a. Although a nursery was utilized in both studies, it was held only during the brief training sessions. Nursery sessions were too brief to give parents a needed respite from child care.
- b. The nursery was used for recreational purposes only, and not for in-shelter training, as recommended in the Handbook.

## 2. Recommendation

The nursery should be implemented in community shelters having children.

## F. Religious Activities

### 1. Conclusion

A shelter-wide, non-denominational Sunday morning religious service was well received.

### 2. Recommendation

Religious services have been found to aid shelter morale and should be adopted as part of shelter routine.

## G. Eating

### 1. Conclusions

- a. Sanitation, i.e., handling of crackers and carbohydrate supplement in an unsanitary manner and oral suction to induce water siphoning, as well as lack of proper control and inventory of rations, was a major problem in ES VII.
- b. The food ration allotment check list used in ES VIII alleviated the problem of inequitable ration distribution.

### 2. Recommendation

Food handlers should be required to sanitize their hands prior to dispensing food.

## H. Sleeping

### 1. Conclusions

- a. In both studies, lack of proper supervision resulted in inequitable distribution of space during the night as well as daylight hours, and neglect of proper sleeping arrangements for single sheltrees.
- b. Failure to roll up or otherwise compactly stow bulky items of bedding during daytime, in an already restricted environment, resulted in a constant space problem.

## 2. Recommendations

- a. To insure adequate night rest, management should be impressed with the importance of equitable space allocation and proper supply stowage, as encouraged in the Handbook.
- b. A specified lounge area for those persons who prefer to talk and be awake after the regular retirement hour is necessary to ensure proper sleep conditions for others.
- c. In the event of severe shelter overcrowding, and if the shelter configuration and situation permits, shift sleeping should be implemented.

## IV. Shelters Reactions

### Conclusions

- 1. The most frequent positive diary comments involved general remarks or comments about other persons in the shelter. The most frequent negative comments focused on complaints about lack of space.
- 2. In ES VII the average estimate of shelteree endurance of continued confinement was 5.8 days; in ES VIII, 8.0 days.
- 3. Approximately 80% of the shelterees stated that they would have volunteered to participate in the studies if they had known test conditions. Approximately 70% of the shelterees indicated they would volunteer for shelter confinement again.
- 4. Shelterees felt that food rations and toilets needed improvement.
- 5. When asked what items they wished they had brought with them or what items they had brought into the shelter had been most helpful, shelterees indicated primary concern over food supplies and bedding.
- 6. The following factors emerged as primary discomforts: the lack of facilities for bathing, the toilet facilities, a dirty environment, and lack of space.

## V. Medical Aspects

### A. Conclusions

1. The location of the Medical Area was deemed unsatisfactory; however, management did not relocate it in a more appropriate location.
2. Doctor-nurse teams serving eight-hour shifts were adequate in meeting the medical needs manifested under study conditions.
3. The most frequently registered medical complaint was headache. This was a standing complaint in ES VIII; however, in the longer study (ES VII) it tended to diminish after the second day.
4. Adults in the 20-39 age range registered a greater percentage of the total medical complaints than any other age group.
5. Females registered more medical complaints than males.
6. There was an evident trend toward more frequent complaints related to respiratory infections or irritations. ES VII physicians reported the increase in upper respiratory infections and tonsillitis, particularly among the children, as the most significant medical problem.

### B. Recommendations

1. Medical personnel suggested the following additional medications for shelter use: a cough syrup containing codeine; an antiemetic; an antacid or anticholinergic medication not having the rebound phenomenon of sodium bicarbonate; stimulants for treatment of asthmatic and cardiac conditions; ammonia; and a medication for nausea. Additional medical supplies suggested by medical personnel were: bandaids and adhesive tape; a cleansing agent other than alcohol; airways; air-bag splints; folded paper cups; additional thermometers and a thermometer container; and a looseleaf notebook for maintaining treatment records.
2. Shelter management staff should give emphasis to the appropriate location and delineation of the Medical Area.

## VI. Environmental Variables

### A. Conclusions

1. Temperature-Humidity Index ranges of 73.6°F to 79.0°F were at times uncomfortable but were tolerated by the shelterees.
2. The ventilation system was adequate for the shelter configuration even with the outside dry-bulb temperatures in the 80s.
3. The additional length of the siphon hose in the newer sanitation kits was helpful, but a siphoning problem still existed.
4. The stocked cups in both studies were not substantial enough for the rigors of shelter living.
5. Additional sanitation supplies stocked in ES VIII (brooms, mops, and rags) proved helpful.

### B. Recommendations

1. Future investigations should evaluate the use of multi-chambered, aboveground shelter space under conditions of natural ventilation.
2. Reduced space allotment and temperature stress variables need investigation.
3. Various methods of heating and cooling shelters should be experimentally tested with human occupants.
4. Stronger and more durable drinking cups should be stocked.
5. Improved methods for dispensing water must be developed. For example, the hose clip provided with the fountain syringe in the medical kit is a very effective valve for the siphon hose. More of these clips should be stocked. This would eliminate water loss and oral suction, the primary problems encountered in water dispensing.
6. Additional sanitation supplies such as brooms and mops should be stocked.
7. Public information on fallout shelters should emphasize that important items to bring into a fallout shelter include flashlights, portable radios, prescription medications, infant needs, and blankets.

8. Sanitary napkins should be rationed by the medical staff to prevent excessive use. Toilet tissue should be rationed by the commode monitors to prevent excessive use.
9. Metal drums should replace the fiberboard sanitation kit drums as initial commodes.

### Forecast

For 1966 two tests have been proposed and approved. Because space allotment may be a critical problem in the utilization of fallout shelters across the nation, this factor will be the primary experimental variable studied in a 100-200 person occupancy test (Experimental Study IX). A second study, involving 500 persons (Experimental Study X), will be conducted to assess management problems in groups larger than the 300-person configuration. In both ES IX and ES X there will be continued evaluation of shelter organization, programming, and environmental variables emerging from previous tests.

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## 13. ABSTRACT

From 1962 through 1965 the University of Georgia Civil Defense Research Staff conducted eight simulated community fallout shelter occupancy tests for the Office of Civil Defense.

Investigated variables included organizational and environmental factors. Participants were men, women, and children, aged 1-70 years.

The last two 300-person tests, conducted in 1965, form the basis for this report. Details of previous occupancy tests may be found in prior annual reports.

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